H.R. 5435, "AMERICAN PUBLIC LANDS AND WATERS CLIMATE SOLUTION ACT OF 2019," AND H.R. 5859, "TRILLION TREES ACT"

LEGISLATIVE HEARING

BEFORE THE

COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

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Wednesday, February 26, 2020
U.S. House of Representatives
Committee on Natural Resources
Washington, DC

The Committee met, pursuant to notice, at 10:07 a.m., in room 1324, Longworth House Office Building, Hon. Raúl M. Grijalva [Chairman of the Committee] presiding.

Present: Representatives Grijalva, Sablan, Huffman, Lowenthal, Cox, Neguse, Levin, Haaland, Cunningham, Velázquez, Dingell, Soto, Tonko, García; Bishop, Young, Gohmert, McClintock, Gosar, Westerman, Curtis, and Hern.

Also present: Representative Gianforte.

The CHAIRMAN. The Committee on Natural Resources will now come to order. The Committee is meeting today to hear testimony on two pieces of climate change legislation: H.R. 5435, the American Public Lands and Waters Climate Solution Act is legislation that I and other members of the Committee introduced at the end of last year; and H.R. 5859, the Trillion Trees Act, was introduced earlier this month by Congressman Westerman of the Committee.

Under Committee Rule 4(f), any oral opening statements at the hearing are limited to the Chairman and the Ranking Minority Member. Therefore, I ask unanimous consent that all other Members' opening statements be made part of the hearing record if they are submitted to the Clerk by 5 p.m. today.

Hearing no objection, so ordered.

I also ask unanimous consent that Congressman Greg Gianforte be allowed to sit on the dais and participate in this morning's hearing.

Hearing no objection, so ordered.

First I want to welcome our witnesses, and particularly thank those of you who have traveled great distances to be here today. It is very much appreciated.

STATEMENT OF THE HON. RAÚL M. GRIJALVA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARIZONA

The CHAIRMAN. In 2019, the Natural Resources Committee heard from a broad range of voices, including those voices that are all too often not listened to, about how Congress must act decisively and act to deal with climate change, which is the greatest environmental, economic, and public health threat of our time.

I am very glad today that we have the opportunity to discuss some bipartisan solutions to this enormous problem. For too long, my friends on the other side of the aisle denied that this was even a real issue. They would reject, or even mock, the overwhelming scientific consensus that the planet is warming, humans are responsible, and urgent action needs to be taken.

So, I appreciate Congressman Westerman's proposal, and I welcome Republicans into what is hopefully a new chapter for their party to begin to focus on climate solutions and not climate denial.

We all agree that nature-based solutions are critical to combat climate change, but we must not lose focus on what the science tells us we must do to stabilize global temperatures and avoid catastrophic impacts. This will require a lot more than planting new trees and protecting existing forests, such as the Tongass. We must dramatically reduce greenhouse gases and get to net zero emissions as rapidly as possible.

This will require hundreds of steps across all sectors of the economy, coordination across the entire Federal Government, and legislation from almost every congressional committee. Our Committee has a large role to play in that effort.

Oil, gas, and coal extracted from our public lands and waters produce a quarter of America's carbon pollution. At the same time, our natural landscapes only absorb roughly 3 percent of our greenhouse gas emissions each year. That is an unhealthy balance.

My colleague from Arkansas recognizes, as I do, that we need to increase how much carbon our landscapes absorb. We may not agree on the best ways to make that happen, and I have concerns with his legislation, but we are on the same page with regard to that issue.

But all the trees in the world won't stand a fighting chance if we don't cut our fossil fuel emissions. That is why this December, with several other colleagues, the American Public Lands and Waters Climate Solution Act was introduced.

Our bill addresses both sides of the problem, increasing our public lands' ability to absorb, while decreasing what they emit, with the goal of getting to net zero emissions by 2040.

We can't get there operating the same way we have over the past 100 years. H.R. 5435 would pause new fossil fuel leasing on Federal lands and waters for a year and require during that period our land management agencies to hit intermediate emissions reduction targets along the road to 2040.

If the departments fail to meet the emission targets in the bill, they cannot issue more fossil fuel permits or hold new fossil fuel lease sales until they come into compliance.

My bill encourages more renewables on public land, more natural climate solutions, and new technologies such as direct air capture of carbon dioxide that is done safely and effectively on public lands. And we can reduce the climate impacts of oil, gas, and coal, which is what this bill is designed to do.

Our bill is also designed to help workers and communities dependent on fossil fuel extraction by setting up a new transition assistance fund. Money in this fund would be returned to impacted regions to be used for reclamation and restoration of land and water, retraining of workers, and diversifying local economies.

Current and future generations are demanding we follow the science and act boldly to limit emissions from fossil fuels. I think it is time that we listened.

[The prepared statement of Mr. Grijalva follows:]

PREPARED STATEMENT OF THE HON. RAÚL M. GRIJALVA, CHAIR, COMMITTEE ON NATURAL RESOURCES

The Committee is meeting today to hear testimony on two pieces of climate change legislation. H.R. 5435, the American Public Lands and Waters Climate Solution Act, is legislation I introduced at the end of last year, and H.R. 5859, the Trillion Trees Act, was introduced earlier this month by Congressman Westerman.

In 2019, the Natural Resources Committee heard from a broad range of voices, including those whose voices are too often not listened to, about how Congress must act to deal with climate change, which is the greatest environmental, economic, and public health threat of our time.

I am very glad that today we have the opportunity to discuss bipartisan solutions to this enormous problem. For too long, my friends on the other side of the aisle denied that this was even a real issue. They would reject, or even mock, the overwhelming scientific consensus that the planet is warming, humans are responsible, and urgent action needs to be taken.

So, I appreciate Congressman Westerman's proposal, and I welcome Republicans into what is hopefully a new chapter for their party focused on climate solutions, not climate denial.

We all agree that nature-based solutions are critical to combat climate change. But we must not lose focus on what the science tells us we must do to stabilize global temperatures and avoid the most catastrophic impacts. This will require a lot more than planting new trees and protecting existing forests, such as the Tongass. We must dramatically reduce greenhouse gases and get to net zero emissions as rapidly as possible, and no later than the middle of this century.

This will require hundreds of steps across all sectors of the economy, coordination across the entire Federal Government, and legislation from almost every congressional committee. Our Committee has a very large role to play in this effort.

Oil, gas, and coal extracted from our public lands and waters produce nearly a quarter of America's carbon pollution. At the same time, our natural landscapes only absorb roughly 3 percent of our greenhouse gas emissions each year. That's an unhealthy balance.

My colleague from Arkansas recognizes, as do I, that we need to increase how much carbon our landscapes absorb. We may not agree on the best ways to make that happen, and I have concerns with his bill, but we are on the same page there.

But all the trees in the world won't stand a fighting chance if we don't cut our fossil fuel emissions. That's why in December, several of my colleagues and I introduced the American Public Lands and Waters Climate Solution Act.

Our bill addresses both sides of the problem, increasing what our public lands absorb while decreasing what they emit, with a goal of getting to net zero emissions by 2040.

We can't get there operating the same way we have over the past 100 years. That's why my bill would pause new fossil fuel leasing on Federal lands and waters for a year and require our land management agencies to hit intermediate emissions reduction targets along the road to 2040.

If the departments fail to meet the emissions targets in the bill, they cannot issue more fossil fuel permits or hold new fossil fuel lease sales until they come into compliance.

My bill encourages more renewables on public land, more natural climate solutions, and new technologies such as direct air capture of carbon dioxide, if we can do that safely and effectively on public lands.

We can't simply shut off existing production or close operating mines. But we can reduce the climate impact of that oil, gas, and coal, which is what my bill is designed to do.

Our bill is also designed to help workers and communities dependent on fossil fuel extraction by setting up a new transition assistance fund. Money in this fund will be returned to impacted regions to be used for reclamation and restoration of land and water, retraining workers, and diversifying local economies.

Current and future generations are demanding we follow the science and act boldly to limit emissions from fossil fuels. It's time we listened.

The CHAIRMAN. I will now recognize the Ranking Member, Mr. Bishop, for his opening statement.

Mr. Bishop, you are recognized.

STATEMENT OF THE HON. ROB BISHOP, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF UTAH

Mr. BISHOP. Thank you, Mr. Chairman. I appreciate the opportunity of being here with you again on this wonderful, great day.

[Laughter.]

Mr. BISHOP. I am somewhat perplexed, at least Mussolini had the trains run on time. If this leadership could actually get the damn elevators to run on time and not in a pack in this building, it would be a whole lot easier for all of us.

Sometimes I am perplexed as to why we are even here this week, without having anything to vote yesterday or the day before. I suppose it was an effort to make sure that everyone was able to watch last night, and the latest version of the Democratic demolition derby. I know I enjoyed that opportunity of that unfettered access to that spectacle in South Carolina, but then we get to come here again, as we now have another version of the David Watkins production of "As the World Turns." And we will have riveting testimony I can understand.

Mr. Westerman has a bill that actually is a common-sense solution that you can solve carbon, either by limiting how much goes into the air, or trying to pull it out of the air. Not only is his bill, which has been endorsed by many of the Democrats who are no longer running for president, but they did run for president, as an idea. But also, if we were to expand that and use grazing on public lands, you could also even suck more carbon out of the atmosphere.

So, it is processed. I know there are some that are thinking it is not the silver bullet to solve the problem. Perhaps not. But the other bill we are going to be dealing with is another bullet that is going to be used to shoot ourselves in the foot. Actually, Barney Fife's bullet was more useful than this bill would be, as far as coming up with an overall policy for the United States.

If indeed the goal of the first bill, which is to end all leasing, were to come into fruition, or at least allow litigation to make sure

that the rest of it is stopped at some point, it will have the net effect of destroying Western schools. I care about kids.

Much of the legislation that we want to see passed this year has been held up because of this insistent threat that we have to fully fund LWCF. But to realize that the Grijalva bill was to pass into law, we would not fund any LWCF. That is the entire revenue source for it. And any efforts to try to solve the backlog problem in our parks would also be decimated.

It is wonderful that when you try to satisfy special interest groups, you can't satisfy them all without actually destroying all of them at the same time.

So, we are here, and, in fact, I think it is illustrated by the fact that, of all the witnesses that we have, none of them even made reference to the Grijalva bill in their written testimony.

I hope you will actually give some verbal shout-outs to it, because that is the reason you are supposedly here.

I am sure this is going to be a fascinating—another series of ongoing hearings, first on climate change. I am sure it is going to be just as good as the one we had when we discussed how concussions in the NFL have an impact on climate.

One of the strange things that we are looking at, though, if we actually deal with reality, is that even though production of fossil fuels in the United States is increasing—can you hit the chart right there—the actual emissions are decreasing in the same time period. According to the International Energy Agency, in 2019 the United States saw the largest decline in energy-related CO_2 of any nation. And furthermore, it has seen the largest decline of any energy-related emissions of any country since the year 2000.

We are also using less and less land to produce our energy development, which means, actually, something is going in the right direction here.

But if indeed we want to cater to special interest groups and say, yes, we will pass interest groups' legislation to make you feel happy about it, and allow you to litigate even more than you are doing right now, well, this Committee is going in the right direction. But it is contradictory. You can't say we love LWCF and we want to fund those programs, we love our parks and we want to prepare those and keep those going, and at the same time come up with a policy to end all leasing. It just doesn't work, which is one of the reasons why we long for an era in which the majority of this Committee actually has a policy that has some kind of consistency and rationality to it.

It is probably not going to happen today, but I am looking forward to all of the testimony on different issues which really don't deal with the Grijalva bill. Maybe a few of them will deal with the Westerman bill.

I yield back, sir.

The CHAIRMAN. The gentleman yields back. The sponsor of the Trillion Trees Act, Mr. Westerman, 5 minutes.

STATEMENT OF THE HON. BRUCE WESTERMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARKANSAS

Mr. WESTERMAN. Chairman Grijalva, Ranking Member Bishop, fellow colleagues, thank you for the opportunity to talk about the Trillion Trees Act.

My legislation represents a pragmatic, science-based first step in addressing global carbon emissions, emphasizing natural carbon sequestration through reforestation, forest management, and sustainable utilization.

Mr. Chairman, I would like to submit for the record this paper published in the Journal of Sustainable Forestry, "Carbon, Fossil Fuel, and Biodiversity Mitigation With Wood and Forests." It is from Yale University and the University of Washington.

The CHAIRMAN. Without objection.

Mr. WESTERMAN. Scientists have documented carbon dioxide increases from 283 parts per million in 1800 to 315 parts per million in 1958 to current 411 parts per million. Americans want Congress to act. According to the Pew Research Center, most Americans currently list the environment as one of the top policy priorities. For Americans under 30, more than three-quarters of those surveyed think the environment should be a focus, and we need to listen to them.

The good news is we have already begun acting. Despite public misconception, the United States leads the world in reducing emissions while we are growing our economy. In 2006, the U.S. GDP was slightly over $14 trillion, and CO_2 emissions peaked at just over 6 gigatons. By 2019, our economy had grown by 55 percent to $21.7 trillion, while our CO_2 emissions dropped 3.6 percent to 5.8 gigatons. During this time, we also witnessed a decrease in energy costs.

However, there is much work that remains, and there is much that we can do. That is why I introduced the Trillion Trees Act as part of a broader initiative to offer practical solutions to this complex global problem.

While the potential for emissions reductions and storage offered by trees and wood products as outlined in this policy is significant, it is not the only answer. There are two components to this legislation that I want to make sure everyone understands.

First, this policy will result in reduced carbon emissions. In case you missed that, I will repeat. This policy will result in reduced carbon emissions. It will reduce carbon emissions through an incentive-based tax credit up to 25 percent rewarding sustainable construction based on three criteria.

Part of the credit will require a reduction in energy used and carbon emitted in manufacturing and transporting building materials to the job site.

Part of the credit will require a reduction in energy used and carbon emissions to heat, cool, ventilate, light, and operate the building over its lifetime.

The remaining portion of the credit will be based on the amount of carbon stored in the completed structure.

This policy will also result in reduced carbon emissions by capturing energy from dead residual biomass materials that are

already on a pathway to becoming atmospheric carbon. This will offset the equivalent amount of carbon-emitting energy that otherwise would have to be used to meet energy demands.

Let me repeat again. This policy will result in reduced carbon emissions.

The second component of the legislation that I want to make clear is that this policy will result in reducing CO_2 concentrations that are already in the atmosphere. Think about it. If all man-made CO_2 emissions were somehow miraculously stopped, what do we do about the 411 parts per million of CO_2 already in the atmosphere? The answer is trees. Unequivocally, the most pragmatic, proactive, economical, and large-scale solution to reducing atmospheric carbon levels is sustainable forestry. And I respectfully ask anyone to offer a better solution.

In every tree, miraculous science is constantly taking place. Every second of every day, quadrillions of sub-cell organelles called chloroplast are at work in a single tree doing what they do best: combining water, sunlight, and carbon dioxide to make carbon-rich plant food, while releasing oxygen back into the atmosphere. That carbon stays in the tree even after it is cut down and turned into buildings, furniture, and a whole host of other products. In fact, 40 to 50 percent of the dry weight of wood is carbon; 40 to 50 percent of this dais, by weight, is carbon.

Why 1 trillion trees? One trillion is a big number, even for the planet. But we are at a point where we need a bold goal to focus our efforts on being the best stewards of our environment, and America has a history of leading the world in bold endeavors. The Trillion Trees Act acknowledges this bold goal, and commits the United States to doing our part.

The Trillion Trees Act, however, is not only about planting more trees. It is bad policy to simply plant trees and walk away. Hence, the Trillion Trees Act is all about management of our forest, keeping existing forestland in forests, and managing these forests where practical to improve resiliency and growth.

The Trillion Trees Act also recognizes that the planet has limited growing space for forest. By contrast, there is no limit to how much carbon forests can pull from the atmosphere if we consider not just the trees that are growing, but also the wood products that these trees can create. Sustainable wood products manufacturing transfers carbon stored in the forest to the wood products and their end uses, resulting in a sustainable increase in carbon stores year after year.

In turn, harvested wood makes space for new trees, restarting the cycle of sequestration.

The United Nations projects 2.3 billion new urban dwellers by 2050. By employing bio-based materials, technologies, and construction assemblies with high carbon storage capacity and low embodied carbon emissions, we can create a durable, human-made global carbon pool, while simultaneously reducing CO_2 emissions associated with building sector activities.

Mr. Chairman, I would like to also submit this paper from Nature Sustainability, titled "Buildings as a global carbon sink."

Every American can support planting a tree. If we can connect that action with sustainability and carbon storage, we are one big step closer to solving a complex problem.

Mr. Chairman, I thank you for allowing me to highlight such a practical piece of legislation, and I look forward to answering any questions from you or other members of the Committee, and I urge swift adoption of this legislation.

The CHAIRMAN. Mr. Bishop has some questions.

Mr. BISHOP. Yes. Do you want me to go ahead of you?

The CHAIRMAN. I don't have any questions.

Mr. BISHOP. OK. All right, Mr. Westerman, let me go through a couple of questions I have.

I have heard some voices out there that have said that this bill is a dangerous diversion from reality. Do you consider it a dangerous diversion?

Mr. WESTERMAN. Not hardly. I consider planting trees and taking care and being good stewards of the forests that we have sound environmental stewardship. And I can't imagine how it could be labeled a dangerous diversion.

I have never said we don't need to reduce carbon emissions, and this bill actually focuses on reducing carbon emissions and sequestering carbon. So, it is not at all a dangerous diversion, but it is a pragmatic, proactive, logical approach that should be bipartisan, and it should have big support.

It is science-based. I will argue the science with anybody who wants to talk about the science behind this bill.

Mr. BISHOP. So, is there any time you have claimed that this is the silver bullet for climate challenges?

Mr. WESTERMAN. Absolutely not.

Mr. BISHOP. Besides this, and perhaps grazing on public lands, do you have a better way of sucking carbon out of the atmosphere and making it productive?

Mr. WESTERMAN. No, and I challenge anybody in the room or outside the room to tell me a better way to get the existing carbon that is in the atmosphere at 411 parts per million, to get that out of the atmosphere.

Sure, we need to reduce the amount of carbon going into the atmosphere. But what do you do about the carbon that is already in the atmosphere? Trees are the natural, logical answer to that.

Mr. BISHOP. See, to me, that is logical. But I am just a layman. You have the degree in forestry. You feel comfortable with that?

Mr. WESTERMAN. I feel very comfortable with that. I think we have understood photosynthesis for a really long time.

Mr. BISHOP. And the fact that the carbon stays in the tree, regardless of what you do with it afterwards.

Mr. WESTERMAN. As long as it is solid, the carbon is there. It is the best carbon storage mechanism that we know of. There is nothing that can store carbon better and for a longer period of time than wood.

Mr. BISHOP. Thank you. I yield back.

The CHAIRMAN. The gentlemen yields back. Let me now introduce our witnesses for today, and thank them again.

Our first witness is Governor Bill Ritter. Governor Ritter was the 31st governor of Colorado, and is the Founder and Director of the Center for the New Energy Economy at Colorado State University.

Thank you for being here, Governor. And I know you have a noon time that you need to be elsewhere, so I appreciate the time.

Our second witness is Ms. Caroline Gleich, a professional ski mountaineer, adventure athlete, and climate activist from Salt Lake City, Utah.

Our third witness is Mr. Jason Walsh, the Executive Director of the BlueGreen Alliance.

Our fourth witness is Mr. Steve Marshall, the Senior Vice President for Policy at SmartLam North America.

Our fifth witness is Dr. Carla Staver, an Associate Professor of Ecology and Evolutionary Biology at Yale University.

And our final witness is Mr. Derrick Hollie, the president of Reaching America.

The witnesses, you have 5 minutes for your oral statement. Your entire statement will appear in the hearing record.

When you begin, the lights on the witness table will turn green, after 4 minutes yellow, and then your time has expired when the red light comes on and I will ask you to please complete the thought that you are on at that point, or statement.

I also will allow the entire panel to testify before any of the Members can ask questions.

Let me now begin by recognizing Governor Ritter for his testimony.

The floor is yours, sir.

STATEMENT OF BILL RITTER, JR., FORMER GOVERNOR OF COLORADO, FOUNDER AND DIRECTOR OF THE CENTER FOR THE NEW ENERGY ECONOMY, COLORADO STATE UNIVERSITY, FORT COLLINS, COLORADO

Mr. RITTER. Thank you, Mr. Chairman. Chairman Grijalva, Ranking Member Bishop, members of the Committee, thank you for the opportunity to speak today, and it is an honor to appear here with my fellow witnesses.

I was the 41st governor of Colorado. I now run a center at Colorado State University and the Chairman referred to that. It is called the Center for the New Energy Economy. But the point of that center is to work with governors around the United States of America, to work with legislators, to do it in a bipartisan way on what we would call the clean energy transition. So, my work for the last 9 years has been doing that. We have a legislator academy that we run, where we are decidedly bipartisan. We have Democratic and Republican state legislators who attend the academy. And then we do a variety of things with governors' offices, but also with utilities.

And, I think, when the Ranking Member referenced that none of the witnesses actually mentioned your act, Mr. Chairman, that was probably my oversight. I apologize. I am absolutely here today to testify regarding H.R. 5435, and, likewise, to support H.R. 5435, Mr. Chairman, with my testimony about the clean energy transition.

There are just a few points that I will make in my 5 minutes. I have 10 pages of written testimony.

Point No. 1 is that it is imperative that we act, and we act swiftly regarding climate change, and that we do all that we possibly can.

I think you, Member Westerman, you said it is not a silver bullet, the Trillion Trees Act. We would agree with that, there are so many other things we have to do. And partly why I would support H.R. 5435 is because it is one of the things we have to do.

There is a transition happening in this country. If you look at all the coal that existed in 2008, 95 percent of that is going to be gone in 2035 or 2037. If you look at all the planned retirements, the resource planning that is going on, but look at also the age of the coal plants, no CEO of a utility in the West would disagree with that, if I made that statement, and I have before. There is this transition out of coal that is happening.

There is certainly new natural gas that is being built in some places around. But as we look to the West, where so many public lands are, out of the net natural gas that existed in 2008 with all the coal that has come offline, renewables have replaced it.

So, in this clean energy transition, when we sort of were starting it in Colorado in 2007 and 2008, there were a lot of people who were saying to us that we shouldn't do that, that it was going to be too expensive, it would be difficult to integrate renewables onto the grid. They gave us a variety of reasons.

And now, one of the reasons that coal is coming offline has nothing to do with policy, it has everything to do with markets. I just moderated a panel with the Senior Vice President of PacifiCorp and the CEO of Tri-State. They are two very significant Western utilities, and they are both talking about their transition out of coal, and largely their transition to renewable energy or clean energy. So, that is one of the things that I think it is important for us to focus on.

Why public lands? Because in the West, public lands matter so much. And people from outside the West may not appreciate this, but places like Nevada are 85 percent public lands; Idaho is 60-some percent; Colorado, where I was governor, 45 percent public lands; and Wyoming 45 percent public lands. And they are a part of our carbon footprint in America.

So, I think my purpose of being here today is saying there is an energy transition happening in the United States. It is happening in a bipartisan way at the state, the city, and the corporate level. It is happening among utilities. I think the 16th major utility just announced a goal of 100 percent carbon-free in some respects by 2050. So, it is happening, but it is not happening necessarily on public lands, where we have 20-some percent of the carbon footprint.

In my mind, H.R. 5435, first of all, addresses that part of it, that it should be public lands that we focus on, and the carbon footprint there.

But the second part of it is the funding mechanism for coal-dependent communities around America that are badly in need of help as we shut down coal in the West. We have a variety of places that are going to have a very difficult time without some kind of

a Federal plan for assistance in trying to have the right kind of economic activity to revitalize those communities. H.R. 5435 addresses the climate problem, but also addresses an economic problem that is a very real problem in places throughout the West. And I support the legislation for that reason.

And we will be happy to answer any questions when the time comes. Thank you, Mr. Chairman.

[The prepared statement of Mr. Ritter follows:]

PREPARED STATEMENT OF BILL RITTER, JR., 41ST GOVERNOR OF THE STATE OF COLORADO; DIRECTOR OF THE CENTER FOR THE NEW ENERGY ECONOMY AT COLORADO STATE UNIVERSITY

Chairman Grijalva, Ranking Member Bishop, and members of the Committee. Thank you for the opportunity to speak to you today.

As Colorado's 41st governor, I led our state's transition to a clean energy economy. I made this transition a top priority of my administration and during my 4 years in office, I signed 57 clean energy bills into law. Today, Colorado boasts a vibrant clean energy economy. Forty percent of all of our energy workers are employed in clean energy industries; and Colorado ranks sixth in the Nation in jobs in renewable energy. In 2018, job growth across all clean energy sectors was 4.8 percent, double statewide job growth. Our clean energy employers predicted that 2019 job growth would be more than double 2018 at 10.3 percent.[1] This growth has been shared across all counties in Colorado.

I continue to lead the national transition as the Director of the Center for the New Energy Economy (CNEE). I founded CNEE in 2011 as a Department of our state's land grant institution, Colorado State University. Our non-partisan initiative works directly with governors, legislators, regulators, utilities, and other stakeholders to facilitate America's transition to a clean energy economy. CNEE is committed to a responsible and equitable transition and to serving diverse stakeholders with our collective expertise in energy systems, policy, politics, economics, sociology, law, and environmental science.

THE CLEAN ENERGY TRANSITION

Our current efforts to mitigate greenhouse gas (GHG) emissions and adapt to the impacts of climate change are falling short of what many estimate will be needed to avoid substantial and irreversible damages to economies, ecosystems, and human health and well-being.[2] Without a concerted and collaborative intergovernmental and intersectoral effort to mitigate and adapt, the impacts associated with climate change are also expected to "increasingly disrupt and damage" our critical infrastructure and national security. The Fourth National Climate Assessment estimates that without significant action, "annual losses in some economic sectors are projected to reach hundreds of billions of dollars by the end of the century—more than the current gross domestic product (GDP) of many U.S. states."[3]

Mitigating GHG emissions not only reduces our exposure to the longer-term economic and health risks associated with climate change, there are also more immediate benefits associated with reducing emissions. These include improving air quality, which benefits public health, the environment, and economic activity by reducing emissions that contribute to asthma, heart disease, lost productivity, smog,

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[1] Environmental Entrepreneurs (E2) and Colorado Solar & Storage Association. 2019. Clean Jobs Colorado. Accessed: 16 Feb. 2020. Available: https://www.e2.org/wp-content/uploads/2019/09/E2-Clean-Jobs-Colorado-2019.pdf.

[2] See: Intergovernmental Panel on Climate Change (IPCC). 2014. *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Core Writing Team, R.K. Pachauri and L.A. Meyer, eds. *IPCC*. Geneva, Switzerland. 151 pp. Accessed: 18 Feb. 2020. Available: https://www.ipcc.ch/report/ar5/syr/; and Jay, A., et al. 2018. Overview. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. Reidmiller, D.R., et al. (eds). *U.S. Global Change Research Program.* Washington, DC. pp. 33–71. doi: 10.7930/NCA4.2018.CH1. Accessed: 17 Feb. 2020. Available: https://nca2018.globalchange.gov/downloads/.

[3] U.S. Global Change Research Program. 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. Reidmiller, D.R., et al., eds. *U.S. Global Change Research Program.* Washington, DC. doi: 10.7930/NCA4.2018. Accessed: 17 Feb. 2020. Available: https://nca2018.globalchange.gov/downloads/.

acid rain, and crop damage, to name a few.[4,5] The Fourth National Climate Assessment notes that "[r]ecent studies suggest that some of the indirect effects of mitigation actions could significantly reduce—or possibly even completely offset—the potential costs associated with cutting greenhouse gas emissions."[6]

The time to act is now. In 2018, the IPCC found that we must reduce global GHG emissions to net-zero by 2050 to limit warming to 1.5 degrees Celsius above pre-industrial levels.[7] Also in 2018, the U.S. Geological Survey found that an average of approximately 25 percent of annual national GHG emissions are associated with fossil fuel development, and the downstream use of those fuels, on public lands.[8] A recent report by The Wilderness Society (TWS) warns that the emissions associated with activity on public lands might be on the increase: leases approved between January 2017 and January 2020 "could result in life cycle emissions between 1 billion and 5.95 billion [metric tons of carbon dioxide equivalent]." On the low end, TWS estimates that these emissions would be equivalent to the total annual emissions of Brazil. On the high end, these emissions would equal more than half of China's annual emissions.[9]

Public pressure for action, as Americans increasingly experience the effects of climate change, is mounting. At least 46 percent of Americans think climate change is a very serious threat to the United States.[10] Seventy percent of Americans support some sort of government action to address climate change and at least 34 percent believe that passing a bill to address climate change should be a high priority for Congress.[11]

The American people and their state and local leaders recognize the wisdom in reducing emissions for a number of reasons including economic opportunity, public health, and reducing the risks associated with climate change. State and local governments continue to lead the Nation in developing clean energy policy. For instance, 13 states, Puerto Rico, and the District of Columbia have adopted, in statute or by executive order, 100 percent clean energy goals. One hundred fifty-nine cities, including 8 of the top 30 largest cities (by population), have adopted or have already met 100 percent clean or renewable energy goals.[12] Of the states that have adopted 100 percent clean energy goals, seven are located in the Western United

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[4] These pollutants include particulate matter, ozone, oxides of nitrogen, and sulfur dioxide.

[5] See also: Jay, A., et al. 2018. Overview. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. In Reidmiller, D.R., et al., eds. *U.S. Global Change Research Program.* Washington, DC. pp. 33–71. doi: 10.7930/NCA4.2018.CH1. Accessed: 17 Feb. 2020. Available: https://nca2018.globalchange.gov/downloads/.

[6] Ibid.

[7] Davenport, Coral. 2018. Major Climate Report Describes a Strong Risk of Crisis as Early as 2040. *The New York Times*. 7 Oct. Accessed: 18 Feb. 2020. Available: https://www.nytimes.com/2018/10/07/climate/ipcc-climate-report-2040.html.

[8] Merrill, M.D., et al. 2018. Federal lands Greenhouse Emissions and Sequestration in the United States—Estimates for 2005–14: U.S. Geological Survey Scientific Investigations Report 2018–5131, 31 p. Accessed: 19 Feb. 2020. Available: https://pubs.usgs.gov/sir/2018/5131/sir20185131.pdf.

[9] The Wilderness Society. 2020. The Climate Report 2020: Greenhouse Gas Emissions from Public Lands. The Wilderness Society. Accessed: 19 Feb. 2020. Available: https://www.wilderness.org/sites/default/files/media/file/TWS_The%20Climate%20Report%20_2020_Greenhouse%20Gas%20Emissions%20from%20Public%20Lands.pdf.

[10] Climate Nexus, Yale Program on Climate Change Communication, and George Mason University Center for Climate Change Communication. 2019. National Poll Number pr1922. Accessed: 18 Feb. 2020. Available: https://climatenexus.org/wp-content/uploads/National-Poll-Toplines-Crosstabs-PR1922.pdf; and Kennedy, B. and M. Hefferon. 2019. U.S. Concern about Climate Change is Rising, but Mainly Among Democrats. *Pew Research Center*. 28 Aug. Accessed: 18 Feb. 2020. Available: https://www.pewresearch.org/fact-tank/2019/08/28/u-s-concern-about-climate-change-is-rising-but-mainly-among-democrats/.

[11] Climate Nexus, Yale Program on Climate Change Communication, and George Mason University Center for Climate Change Communication. 2019. National Poll Number pr1922. Accessed: 18 Feb. 2020. Available: https://climatenexus.org/wp-content/uploads/National-Poll-Toplines-Crosstabs-PR1922.pdf; and Volcovici, V. 2019. Americans Demand Climate Action (As Long as It Doesn't Cost Much). *Reuters*. 26 Jun. Accessed: 18 Feb. 2020. Available: https://www.reuters.com/article/us-usa-election-climatechange/americans-demand-climate-action-reuters-poll-idUSKCN1TR15W, and Morning Consult and Politico. 2019. National Tracking Poll #190431. *Morning Consult and Politico*. Accessed: 18 Feb 2020. Available: https://morningconsult.com/wp-content/uploads/2019/04/190431_crosstabs_POLITICO_RVs_v1_ML.pdf.

[12] Sierra Club. 2020. 100% Commitments in Cities, Counties, & States. *Sierraclub.org*. Accessed: 18 Feb. 2020. Available: https://www.sierraclub.org/ready-for-100/commitments.

States.[13] Of the eight largest cities that have adopted clean energy goals, six are located in the West.[14]

The transition to a clean energy economy is not only policy driven, it is also emerging in response to economic realities. Electricity generated using coal now has a higher levelized cost of energy (LCOE) than electricity generated by unsubsidized natural gas combined cycle (NGCC) units, wind, and utility-scale solar.[15] In 2019, Lazard found that building new wind and solar is approaching or has obtained cost competitiveness with the marginal cost of continuing to operate existing coal and nuclear facilities.[16] Analyses by major utilities and others have found that continuing to operate existing coal plants is uneconomical.[17]

Utility scale solar and wind are now also cost-competitive with NGCC units,[18,19] and we are seeing increasingly low renewable energy prices. For instance, Xcel Energy's last all-source solicitation in late 2017 in Colorado attracted over 400 bidders and record low prices for wind and solar. The utility's Colorado Clean Energy Plan includes wind priced between $11–18 per megawatt hour (MWh), solar between $23–27 per MWh, and solar with storage between $30–32/MWh.[20] Xcel Energy expects that increasing the use of solar and wind across its system will reduce future fuel costs and that those savings will be passed directly to all of its customers. According to our state's largest electricity provider, "[t]oday, Xcel Energy's average Colorado customer bill is 35 percent below the national average and has declined by more than 14 percent since 2014. During that same time period, the company added over 1,000 megawatts [(MW)] of wind and solar power to its Colorado system."[21]

A second major Western utility, Tri-State Generation and Transmission, also expects that its transition[22] to clean energy will keep rates flat and might even reduce them.[23] According to Tri-State's CEO Duane Highley, "because wind and solar energy [are now less expensive] than the cost of generating with any fossil fuel, coal or gas . . . those savings in energy costs can be used to help us accelerate the retirement of coal and pay for that accelerated retirement without negative rate impacts."[24]

The environmental and economic benefits are clear, and utilities around the Nation are increasingly investing in lower-cost and less risky clean energy technologies, developing emission reduction strategies, and retiring coal-fired electric generating units. To date, at least 42 electric utilities operating around our country have adopted clean energy or GHG emission reduction goals. Of these, 16 have

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[13] These states are California, Colorado, Hawaii, Nevada, New Mexico, Oregon, and Washington.

[14] These cities are Denver, CO; Los Angeles, CA; Portland, OR; San Diego, CA; San Francisco, CA; and San Jose, CA.

[15] Lazard. 2019. Lazard's Levelized Cost of Energy Analysis: Version 13.0. *Lazard*. Accessed: 19 Feb. 2020. Available: https://www.lazard.com/media/451086/lazards-levelized-cost-of-energy-version-130-vf.pdf.

[16] Ibid.

[17] *See,* for instance: PacifiCorp. 2019. Integrated Resource Plan. Accessed: 21 Feb. 2020. Available: https://www.pacificorp.com/energy/integrated-resource-plan.html. And Dyson, M. and A. Engel. 2018. A Low-Cost Energy Future for Western Cooperatives: Emerging Opportunities for Cooperative Electric Utilities to Pursue Clean Energy at a Cost Savings to Their Members. *Rocky Mountain Institute*. Accessed: 21 Feb. 2020. Available: https://www.rmi.org/wp-content/uploads/2018/08/RMI_Low_Cost_Energy_Future_for_Western_Cooperatives_2018.pdf.

[18] The LCOE of unsubsidized utility scale solar in 2019 was $32–44/MWh, unsubsidized onshore wind was $28–54/MWh, and unsubsidized NGCC was $44–68/MWh.

[19] Lazard. 2019. Lazard's Levelized Cost of Energy Analysis: Version 13.0. Lazard. Accessed: 19 Feb. 2020. Available: https://www.lazard.com/media/451086/lazards-levelized-cost-of-energy-version-130-vf.pdf.

[20] Correspondence with Xcel Energy. And: Smyth, J. 2018. Colorado Energy Plan Analysis Shows Switching from Coal to Renewable Energy Will Boost Jobs and Local Tax Revenue. *Clean Cooperative*. 22 Jun. Accessed: 23 Feb. 2020. Available: https://www.cleancooperative.com/news/colorado-energy-plan-analysis-shows-switching-from-coal-to-renewable-energy-will-boost-jobs-and-local-tax-revenue.

[21] Correspondence with Xcel Energy.

[22] Tri-State's Responsible Energy Plan includes the addition of 1 gigawatt of wind and solar and GHG emissions reductions in Colorado by 90 percent of 2005 emissions by 2030. The utility operates in four Western states: Colorado, Nebraska, New Mexico, and Wyoming.

[23] Best, A. 2020. Tri-State CEO Says Wholesaler's Clean Energy Transition Will Pay Dividends. *Energy News Network*. 21 Jan. Accessed: 23 Feb. 2020. Available: https://energynews.us/2020/01/21/west/tri-state-ceo-says-wholesalers-clean-energy-transition-will-pay-dividends/.

[24] Smyth, J. 2020. Tri-State Will Replace Coal Plants with A Gigawatt of New Wind and Solar. Clean Cooperative. 9 Feb. Accessed: 23 Feb. 2020. Available: https://www.cleancooperative.com/news/tri-state-will-replace-coal-plants-with-a-gigawatt-of-new-wind-and-solar.

adopted 100 percent clean energy or net-zero GHG emissions goals. Of the utilities that have adopted clean energy or GHG emissions reduction goals, 17 operate in the Western United States, and eight of these utilities have set 100 percent clean energy or net-zero GHG emissions goals.[25]

Across nine Western states,[26] over 17,000 MW of coal-fired electric generating capacity is scheduled to retire by the end of 2031. The bulk of these retirements (11,470 MW) are scheduled to occur before the end of 2025 and will or already have impacted communities across the West.[27] As coal plants retire, the mines that supply them will also shutter. Our coal-reliant communities are facing a great deal of economic and social uncertainty. This is especially the case because these communities can be mono-industrial, where the industry is not only a crucial economic driver but is also associated with identity and heritage.

We have heard examples of coal miners and power plant employees out of work without enough notice, and communities suffering direct and indirect job loss as well as the loss of tax revenue associated with the local coal industry. Some towns receive over half of their budgets from coal-related industries; and without this revenue, local government services, including public schools, safety, and infrastructure can be left underfunded.

At CNEE, we believe that the transition to a clean energy economy needs to be equitable for all involved. Embracing the notion of a "just transition" acknowledges that these communities have provided energy for our economy for decades, and that they should not be left behind as we transition to clean energy. States, local governments, non-profits, utilities, mine owners, and other stakeholders are beginning to consider, promote, and implement policies and programs to support a just transition. For instance, New Mexico enacted legislation last year that includes funding for workforce and economic development activities in communities impacted by coal plant closures.[28] A bipartisan proposal currently in front of the West Virginia Legislature[29] is modeled after legislation enacted last year in Colorado, to which I will now speak.

Colorado created the Nation's first Office of Just Transition. The Office, along with an advisory committee also established by the legislation, is tasked with creating a just transition plan that will describe how the Office can most effectively respond to the economic changes associated with coal plant and coal mine closures in Colorado.[30] Colorado House Bill 19–1314 also requires that utilities that accelerate the retirement of a generating unit submit a workforce transition plan to the Office and the affected community at least 6 months before the unit is retired. The first coal-reliant community meetings will be held by Colorado's Just Transition from Coal Advisory Committee next week (March 4th–6th). The communities they will be visiting are communities our Center has been working with for the last year.

The towns of Craig and Hayden are coal-reliant communities in northwestern Colorado. Craig is home to the Craig Generating Station, which hosts three coal-fired generating units with a capacity of 1,283 MW. Unit 1 is scheduled to be retired by 2025, unit 2 by 2026, and unit 3 by 2030. Craig is located in Moffat County, which is classified by the U.S. Department of Agriculture as a "mining dependent" county. In 2015, over 700 direct jobs, and more than 1,000 indirect jobs in the county were dependent on coal. The smaller town of Hayden, just east of Craig, is home to the Hayden Generating Station, which has two generating units with a combined capacity of 446 MW. Unit 1 is scheduled to retire in 2030, unit 2 in 2036. A spokesperson for Xcel Energy said that the 64 employees working at the plant will have the option to be transferred to other jobs within the utility when the plant is retired.

Our staff has met with local county commissioners, city managers, economic development offices, small business owners, and other community stakeholders in both towns. We have learned that the communities of Craig and Hayden are experiencing the energy transition differently, as we would expect to be the case.

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[25] These utilities are: Arizona Public Service, Austin Energy, Avista, Hawaiian Electric Utilities, Idaho Power, Platte River Power Authority, Public Service Company of New Mexico, and Xcel Energy.

[26] Arizona, Colorado, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming.

[27] Last year, 3,231 MW was retired in Arizona (2,409 MW at Navajo Generating Station), Colorado, Montana, and Wyoming.

[28] New Mexico Senate Bill 19–489. Available: https://www.nmlegis.gov/Legislation/Legislation?Chamber=S&LegType=B&LegNo=489&year=19.

[29] West Virginia House Bill 20–4574. Available: http://www.wvlegislature.gov/Bill_Status/bills_text.cfm?billdoc=HB4574%20INTR.htm&yr=2020&sesstype=RS&i=4574.

[30] Colorado House Bill 19–1314. Available: https://leg.colorado.gov/sites/default/files/2019a_1314_signed.pdf.

During our visits to Craig, community leaders expressed concern about the lack of representation of their ideas in the state legislature. They also described coal-fired electricity generation as a central part of their everyday life. Community leaders emphasized that economic responses to the transition should focus on developing natural resources and promoting tourism and recreation, exploring manufacturing or other uses for coal, and enhancing local educational opportunities. They have worked with economic development experts in the past year to develop a plan to diversify their economy.

In Hayden, the community has creative ideas that they want to share with others. While they are proud of their small town and the culture that surrounds coal, they have begun planning for the transition. The solutions the community emphasized included improving quality of life and the town's infrastructure, collaborating with nearby communities, and proactive planning and engagement with the local community college.

During this process, we learned that existing strategies for supporting communities during a transition have often been in the form of (1) direct financial investment, (2) state policy and program development, (3) worker retraining, or (4) economic diversification. While these strategies can be effective, there is no one-size-fits-all solution. The best strategy to obtain community buy-in for any plan is to listen to and involve the community throughout the planning process.

CLOSING REMARKS

Often the negative effects of degraded air quality and transitioning economic industries disproportionately affect low-income, rural, and minority populations. To adequately and equitably transition to clean energy resources and reduce the risks associated with climate change, the stakeholders closest to and most impacted by this transition need to be listened to and involved in the planning and implementation processes. They must have a real seat at the decision-making table. The best outcomes emerge when community members create their own solutions or strongly support the changes recommended by others.

The United States has withstood other transitions in our energy system and larger economy. It behooves all stakeholders to plan for large-scale change and to fund efforts to support the communities that will be most impacted by any transition. Engaging communities early and directly will allow innovation and the development of proactive strategies that bolster resilience.

QUESTIONS SUBMITTED FOR THE RECORD TO GOVERNOR BILL RITTER

Questions Submitted by Rep. McClintock

Question 1. Wildfires have gotten out of hand in California since our forest management fell on the wayside in the 1970s. We now lose over 2 million acres a year to wildfires. Colorado has a program called "Wildfire Partners"—it was funded locally and by the state until 2019, when it received a FEMA grant.

The public-private partnership has allowed for over 900 Coloradans in high-risk areas to purchase affordable homeowner's insurance after receiving professional help in mitigating against wildfire risk.

The program does a thorough inspection of a residential property, walks the homeowner through exactly what to do to mitigate against wildfire risk, and then certifies the home afterwards so the homeowner can purchase affordable wildfire coverage. It's that simple.

Governor Ritter, why has Wildfire Partners been such a success? Can this success be replicated in California?

Answer.

Highlights

- Since 2014 Wildfire Partners has completed wildfire risk assessments of over 2,100 homes in Boulder County, and provided risk mitigation certificates to 904.
- The program is written into Boulder County's building code, which requires all new homes built in the wildland urban interface to take actions to mitigate wildfire risk. If similar programs are implemented in California and elsewhere, integrating risk mitigation programs into local building codes and permitting will increase participation.

- Following participation in the assessment phase, the program covers up to 50 percent of mitigation costs (up to $2,000) for eligible existing homeowners. This cost-share opportunity increases participation and enhances equity in hazard mitigation.
- Individual home assessments like those completed through the Wildfire Partners Program are most effective at reducing risk in areas where homes are widely spaced; for high density housing developments, assessment and mitigation efforts should take place at the HOA or neighborhood level.
- The Wildfire Partners program is highly effective in large part because it is locally based and participants trust the local individuals performing assessments. State- or federally-led efforts would likely be less successful, however state and Federal dollars can support local efforts like Wildfire Partners across the West, including in California.

Program Overview and Potential for Replication

Wildfire Partners is a nationally recognized model for wildfire mitigation that has successfully reduced wildfire risk for hundreds of homes in Boulder County, Colorado, and could be successfully replicated in other counties and states. Since its inception in 2014, over 2,117 homes in Boulder County have participated in the program and 904 homeowners have received risk mitigation certifications. This represents a significant proportion of the more than 6,000 homes located in the Boulder County wildland urban interface.[1]

The Wildfire Partners Program was recently put to the test in the Cold Springs Fire, which burned over 500 acres of forest near Nederland, Colorado in 2016. All eight of the Wildfire Partners-mitigated homes within the burn area survived.

The program is written into Boulder County's building code, which requires all new homes built in the wildland urban interface to complete and implement a Wildfire Mitigation Plan. The Wildfire Partners Program satisfies this requirement. When a homeowner signs up, a mitigation specialist performs a comprehensive wildfire risk assessment of the home ignition zone with the homeowner. They also discuss insurance and emergency preparedness. The assessment is scientifically based upon defensible space guidelines from the Colorado State Forest Service. Following the assessment, the specialist sends a comprehensive report to the homeowner recommending mitigation actions (e.g. removing specific trees; retrofitting homes and outbuildings with fire-safe materials; fire-resistant landscaping etc.).

While newly built homes are not eligible for mitigation assistance awards, existing homeowners can obtain up to three quotes for mitigation work from local contractors and Wildfire Partners will cover 50 percent of the total cost (not to exceed $2,000). Treating fuels in a 150-foot radius around a house typically costs less than $2,500 in Colorado. Once the landowner completes the actions deemed necessary by the assessment specialist, they receive a certificate from Boulder County that can be used as proof of mitigation for insurance purposes. Several insurance companies are currently accepting Wildfire Partners certificates to ensure homeowners can renew and/or obtain future coverage.

The Wildfire Partners program is staffed by forestry and fire protection experts and advised by insurance companies, including Allstate, that have pledged to accept certificates earned by homeowners who complete work on their property. The program is funded by county money and about $2.6 million in state and Federal grants, including a $1.2 million grant through FEMA's Pre-Disaster Mitigation Grant Program awarded in 2019.

Wildfire Partners' individual home certification model does not work in places where homes are packed tightly together. In those cases, it makes more sense for the entire development to implement concerted mitigation efforts. Such HOA or community-level programs may be necessary for communities in California and elsewhere with very high housing densities, and can be facilitated through the development of a Community Wildfire Protection Plan. Wildfire Partners' model is also most effective when implemented at the county or municipal level, because every community has unique conditions that would not be reflected in a state- or Federal-level program (though local efforts can still be supported by state and Federal funds). Local implementation also builds trust and increases public engagement.

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[1] Note: This estimate is based on 2010 Census data compiled by Headwaters Economics, and counts homes on forested properties within 500 m of National Forest as those in the wildland urban interface. This number likely underestimates the 2020 count. https://headwaterseconomics.org/dataviz/wui-development-and-wildfire-costs/.

Sources:
https://www.wildfirepartners.org/
https://headwaterseconomics.org/dataviz/wui-development-and-wildfire-costs/
https://www.denverpost.com/2019/01/02/wildfire-risk-homeowners-insurance/

The CHAIRMAN. I now recognize Ms. Gleich for your testimony, please.

STATEMENT OF CAROLINE GLEICH, PROFESSIONAL SKI MOUNTAINEER AND ADVENTURER, MEMBER, PROTECT OUR WINTERS, SALT LAKE CITY, UTAH

Ms. GLEICH. When I was 13 years old, I went to rehab. I was severely depressed and I struggled with anxiety. I turned to drugs and alcohol to self-medicate. I didn't think I would live until I was 30. I am 34 today. Right now I can say with confidence that the outdoors saved my life.

Good morning, Chair Grijalva, Ranking Member Bishop, and members of the Committee, and thank you so much for having me here today. My name is Caroline Gleich, and I am a professional ski mountaineer from Park City, Utah. I am here today to testify in support of H.R. 5435, the American Public Lands and Waters Climate Solutions Act.

In 2017, I became the first woman to ski a collection of the 90 steepest and most technical ski lines in the Wasatch Mountain Range in Utah called the Chuting Gallery. And last May, I successfully summited Mount Everest, 7 weeks after fully tearing my ACL. In my career, I have climbed and skied hundreds of mountains all over the world.

I learned to manage my anxiety and depression through skiing and climbing on public lands. I am sure everyone in this room can relate to the experience of finding powerful healing in nature. These pursuits give my life purpose and meaning. My livelihood and my health depend on access to protected public lands and a stable climate. And right now both are at risk.

Climate change is not a thing of the future. It is happening right now. In my home in Park City, Utah our historically light, fluffy powder snow is changing as temperatures warm to the extent that our state slogan, "The Greatest Snow on Earth," may no longer hold true. The average amount of snow in the West has dropped 41 percent since the early 1980s. By 2090, projections indicate that Park City will lose all of its snowpack. Nationally, low snow years have a negative impact on jobs and the economy, costing us more than $1 billion and 17,400 jobs.

We know that burning fossil fuels has increased the concentration of atmospheric carbon dioxide, causing our climate to change. It is also well established that burning fossil fuels releases pollutants that lead to respiratory disorders, stroke, asthma, missed days at work in school, and premature death.

As a woman of childbearing age, I am particularly concerned about the link between exposure to air pollution and miscarriage. A recent study in Salt Lake City, Utah found that raised levels of nitrogen dioxide pollution increase the risk of losing a pregnancy

by 16 percent. And guys, you are not off the hook, either. Studies show that exposure to air pollution decreases sperm count.

Even more, exposure to air pollution is linked to worsening of psychiatric disorders in children, especially for disorders relating to anxiety and depression, disorders like the ones I struggled with as a kid. Forty-eight percent of Americans believe climate change is already impacting our mental health. Our public lands need to be a part of the solution, not a source of the problem. H.R. 5435 ensures that our public lands and waters reduce the effects of climate change, with clear steps to set binding emissions reduction goals. It gives land managers tools to proactively plan for how they will reach these goals.

Additionally, I support the bill's provisions to give special funding to fossil fuel-dependent regions to be used for reclamation and restoration of land and water, transition assistance, worker retraining, and other purposes.

Transitioning to a clean energy economy doesn't just create jobs. It actually improves public health. Eighty percent of voters say that health care is vital to their vote. Did we ever stop to consider what is making us sick in the first place? Our public lands are a crucial part of our Nation's healthcare plan. They are where we go to restore and revitalize ourselves, they create resilience. Studies show that simply being in nature can help lower depression, anxiety, inflammation, and reduce fatigue. They shouldn't be places where we extract fossil fuels that then pollute our air, water, and soil. For too long, the costs of fossil fuels have been externalized, and the public has had to pay.

Now, we have a tendency as a society to compartmentalize public lands, climate, and health into separate boxes. But the truth is, they are all related. Humans need land to roam, clean air to breathe, and safe water to drink. When we become disconnected from nature, we become depressed. As someone who depends on America's public lands for my career and health, I am grateful for the opportunity to share my story of finding hope through the outdoors.

Supporting H.R. 5435 will ensure our treasured wild places do not contribute to the worsening of our climate and, in turn, our health. As an adult, I have learned how to live without being dependent on drugs and alcohol by finding healing in nature and building a life outdoors. Just like I learned to combat my addiction, so too can our country learn to thrive without our dangerous addiction to fossil fuels.

Thank you.

[The prepared statement of Ms. Gleich follows:]

PREPARED STATEMENT OF CAROLINE GLEICH, PROFESSIONAL SKI MOUNTAINEER, ADVENTURER AND CLIMATE ACTIVIST; FOUNDER, BIG MOUNTAIN DREAMS FOUNDATION; AND MEMBER, PROTECT OUR WINTERS

When I was 13 years old, I went to rehab. I was severely depressed and I struggled with anxiety. I turned to drugs and alcohol to self-medicate. I didn't think I'd live until I was 30. I'm 34 now. Today, I can say with confidence that the outdoors saved me.

Chairman Grijalva, Ranking Member Bishop, and members of the Committee, thank you for inviting me to talk about the urgent threat of climate change. My name is Caroline Gleich. I am a professional ski mountaineer, adventure athlete, and climate activist from Park City, UT. I am here today as a part of the $887

billion outdoor industry, which supports 7.6 million American jobs (including mine)[1] to testify in support of H.R. 5435, the American Public Lands and Waters Climate Solution Act.

When I was 18, I began pursuing a childhood dream of becoming a professional skier and outdoor adventure athlete. A decade and a half later, I'm able to make my living as a pro skier, climbing up mountains to ski down, working with sponsors and media to tell stories through photos, videos, and writing. I've been on the cover of magazines including Powder, Ski, and Backcountry. I've skied in Warren Miller films. In 2017, I became the first woman to ski a collection of the steepest and most technical backcountry ski runs in the Wasatch Mountain Range in Utah called the Chuting Gallery, which was documented in a short film called "Follow Through." And last May, I climbed Mt. Everest, 7 weeks after fully tearing my anterior cruciate ligament, or ACL, one of the four major stabilizing ligaments in the knee.

In my career, I've climbed and skied hundreds of mountains all over the world, in the Alps, Andes, Himalayas, Canadian Rockies, and the Alaska Range. I have seen some of the most remote glaciers and stunning alpine areas in the world.

My goal with my career is to inspire people to get outside, live a healthy active lifestyle, and protect the places where we love to play. In building my career in the mountains, I've always used my platform as an athlete to speak about social and environmental issues. In 2010, I was at a pivotal moment in my career. I had to decide whether to pursue academics after finishing my undergraduate degree at the University of Utah or pursue a career as a professional skier and focus on my sport.

During my last undergraduate semester, I did a political internship for Governor Gary Herbert's Environmental Adviser, Ted Wilson, at the Utah State Capitol. I learned a great deal about Utah's energy policy, and I learned how much of Utah's energy production came from coal and fossil fuels. I was astounded that with Utah's abundance of sunshine and wind, the Governor's 10-year energy plan didn't embrace more renewable energy production. At the end of the semester, I wrote a paper critiquing the Governor's Energy Policy that was published in the Hinckley Journal.

As I grew up through my late teens and early twenties, I learned to manage my anxiety and depression through skiing and climbing on public lands. These pursuits have given my life purpose and meaning. My livelihood and health depend on access to protected public lands and a stable climate.

Right now, both are at risk.

Climate change is not a thing of the future—it's happening now. Having spent my lifetime exploring mountain environments, I've experienced warming winters and a diminishing snowpack. As an alpinist, I spend a lot of time climbing glaciers and ice. I've been on expeditions where I sit in my tent and listen to the constant, deafening sound of icefall around me. Increased temperatures are melting away both my sport and my livelihood.

In my home in Park City, UT, I've seen unseasonal rain events in January and February. Our historically light, fluffy powder is changing as temperatures warm to the extent that our state's slogan—the Greatest Snow on Earth—may no longer hold true. The average amount of snow in the West has dropped by 41 percent since the early 1980s, and the snow season has shrunk by 34 days.[2] Projections indicate that by 2090, Park City will lose all of its snowpack.[3]

Low-snow years have a negative impact on jobs and the economy, costing our country more than $1 billion and 17,400 jobs compared to an average season.[4] In Park City alone, economic modeling shows that the projected decrease in snowpack is estimated to result in $120 million in lost output by 2030.[5] More American jobs (695,900) come from spending on snow sports than from the extractive industries (627,900).[6]

Last spring, I went to the Himalayas in Tibet to attempt to climb Mt. Everest, a lifelong goal that I spent a decade training for. You might have seen pictures of the crowds on Everest this year. What the headlines didn't mention is the role climate change played. Research shows that a warming Arctic creates a smaller temperature gradient that affects the jet stream, which normally creates a 7–10 day

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[1] https://outdoorindustry.org/advocacy/.
[2] https://www.sciencedaily.com/releases/2018/12/181212093320.htm.
[3] https://www.nrdc.org/sites/default/files/climate-impacts-winter-tourism-report.pdf.
[4] https://gzg764m8l73gtwxg366onn13-wpengine.netdna-ssl.com/wp-content/themes/pow/img/POW-2018-economic-report.pdf.
[5] http://www.parkcitygreen.org/Community/Community-Footprint/SOS-ClimateStudy.aspx.
[6] https://outdoorindustry.org/wp-content/uploads/2017/04/OIA_RecEconomy_FINAL_Single.pdf.

window for climbers to summit.[7] This year, the window was only 2 days long. With the congestion, by the end of the stretch, 11 climbers lost their lives.

In the Himalayas, air temperatures have already risen by 2 degrees Fahrenheit since the start of the 20th century[8] causing permafrost and glaciers to melt, which then affects the drinking water of 800 million people.[9]

To make matters worse, as glaciers melt, sea levels rise.

We know that burning fossil fuels has increased the concentration of atmospheric carbon dioxide, causing our climate to change.[10] Taking action on climate and protecting public lands is a much bigger issue than my personal happiness. It's well established that burning fossil fuels releases pollutants that lead to respiratory disorders, stroke, asthma, missed days at work and school, and premature death. There is also evidence that poor air quality created by burning fossil fuels is related to autism and Alzheimer's.[11]

Of particular concern to me, as a woman of child-bearing age, is the link between exposure to air pollution and miscarriage. A recent study conducted in Salt Lake City, UT, found that raised levels of nitrogen dioxide pollution, produced from burning fossil fuels, increased the risk of losing a pregnancy by 16 percent.[12] We need to do everything we can to protect our children during each stage of life. Not surprisingly, spending time in natural spaces reduces the risk of preterm birth[13] while also improving quality of life and mental health.

According to the American Psychiatric Association, 48 percent of Americans believe climate change is already harming our mental health.[14] Forty million adults in the United States are suffering from anxiety disorders[15] and one in six Americans take a psychiatric drug, with antidepressants being the most common.[16] Exposure to air pollution is linked to worsening of psychiatric disorders in children, especially disorders related to anxiety and depression[17]—disorders like the ones I struggled with as a kid.

As psychiatric disorders spike, so does the rate of suicide. Suicide is now the leading cause of death for Utahan's aged 10–17.[18]

Our public lands are a crucial part of our Nation's healthcare plan. They are where we go to restore and revitalize ourselves. They create resilience and studies show that simply being in nature can help lower depression, anxiety, and inflammation.[19] Public lands shouldn't be places where we extract fossil fuels that then pollute our air, water, and soil. They should be places where we go to feel alive, connected, and free. For too long, the costs of fossil fuels have been externalized and the public has had to pay the price.

Our public lands need to be a part of the solution, not a source of the problem. H.R. 5435 ensures that our public lands and waters reduce the effects of climate change with clear steps to set binding emissions reductions goals. It gives land managers tools to proactively plan for how they will reach these goals. I appreciate that H.R. 5435 includes a pause on new Federal fossil fuel leasing to allow the Department of the Interior to develop a comprehensive emission reduction strategy.

I first became aware of the link between public lands and climate change at a Federal hearing about coal leasing on public lands in 2016. I was shocked to learn that 40 percent of coal in the United States comes from public lands,[20] leasing them

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[7] https://www.nationalgeographic.com/environment/weather/reference/jet-stream/.

[8] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3352921/.

[9] https://www.nature.com/articles/s41586-019-1240-1.epdf?referrer_access_token=AX7JLWpIdSHK9NI0-GlGLtRgN0jAjWel9jnR3ZoTv0NYNeas1Y6jkcfWY1O41-z3Uq060cO - 2HJwlv3VRbVT6_eMJfcJJmaUCRBmRkvDPH8E391wJrb447sb8G2997zhSegcTNYf3N6ZT96-U6hJH-6_hg7cCYJ19ZouRpM9c9OdeWXX6ZKzjQDfXP7BxqhLsRP2613v1OLRUeYHFlts6PkTnvX3Rf7YIYP5RFs-CwGi8HP5ZH-O2XknSnuJFJDpjovkMMZuigO5c_W1rXUI9R8IHUZso7fWmavCB74Gc%3D&tracking_referrer=www.sciencenews.org.

[10] https://climate.nasa.gov/causes/.

[11] https://www.hsph.harvard.edu/c-change/subtopics/fossil-fuels-health/.

[12] https://www.theguardian.com/environment/2019/jan/11/air-pollution-as-bad-as-smoking-in-increasing-risk-of-miscarriage.

[13] https://www.sciencedaily.com/releases/2018/07/180706102842.htm.

[14] https://www.psychiatry.org/patients-families/climate-change-and-mental-health-connections/affects-on-mental-health.

[15] https://adaa.org/understanding-anxiety.

[16] https://www.scientificamerican.com/article/1-in-6-americans-takes-a-psychiatric-drug/.

[17] https://www.sciencedaily.com/releases/2019/09/190925075731.htm.

[18] https://health.utah.gov/vipp/pdf/Suicide/youth-suicide-factsheet-12-14.pdf.

[19] https://www.health.harvard.edu/mind-and-mood/sour-mood-getting-you-down-get-back-to-nature.

[20] https://www.nytimes.com/2017/08/06/us/politics/under-trump-coal-mining-gets-new-life-on-us-lands.html.

for pennies on the dollar. Meanwhile, the true costs were externalized to the public, who then had to deal with the health risks.

At that hearing, I met Brandon and Mike, two young men from Carbon County, Utah who, like their fathers and grandfathers, made their living as coal miners. Whenever I speak at a hearing, I enjoy hearing all the different perspectives on an issue. As we chatted during a break, they were fascinated to hear about my job as a skier. We had a wonderful exchange and at the end, they told me that they did not like working in the mines. It was dangerous, and they admitted they would take jobs installing rooftop solar if they were available.

Because of that exchange, I am especially supportive of the bill's provisions to give special funding to fossil fuel-dependent regions to be used for reclamation and restoration of land and water, transition assistance, worker re-training, and other purposes.

Transitioning to a clean energy economy doesn't just create jobs. It improves public health. And with 80 percent of voters saying that health care is the most important issue for their vote,[21] it's time we stop and ask ourselves what's really making us sick in the first place.

We have a tendency as a society to compartmentalize public lands, climate change, and health into separate boxes, but the truth is, they are all related. Living close to nature has wide-ranging health benefits and creating better access to nature will create stronger, wealthier communities.[22] Humans need land to roam, clean air to breathe, and safe water to drink. When we become disconnected from nature, we become depressed.

As someone who depends on America's public lands for my career and health, I'm grateful for the opportunity to share my story of finding hope through the outdoors. Supporting H.R. 5435 will ensure our treasured wild places do not contribute to the worsening of our climate, and in turn, our health. Clean air, clean water, and access to the outdoors are basic human rights. It's time we do everything we can to ensure more Americans have access to them, and our public lands are the place to start.

As an adult, I learned how to live without being dependent on drugs and alcohol by finding healing in nature and a life outdoors. Instead of reaching for a pill or a drink, I have now developed healthier coping strategies. Just like I learned to combat my addiction, so too can our country learn to thrive without our dangerous dependence on fossil fuels.

The CHAIRMAN. Thank you very much.

Let me now recognize Mr. Walsh for your testimony, sir.

STATEMENT OF JASON WALSH, EXECUTIVE DIRECTOR, BLUEGREEN ALLIANCE, WASHINGTON, DC

Mr. WALSH. Thank you, Chairman Grijalva, Ranking Member Bishop, and distinguished members of the Committee. My name is Jason Walsh. I am the Executive Director of the BlueGreen Alliance, a national partnership of labor unions and environmental organizations. On behalf of my organization, our partners, and the millions of members and supporters they represent, I want to thank you for convening this hearing today on how we make our public lands part of a climate solution.

Our Nation faces a crisis of climate change, but it also faces a crisis of increasing economic inequality. These dual crises are inextricably linked, as are their solutions. That is why this past summer, the BlueGreen Alliance and our labor and environmental partners released Solidarity for Climate Action. It is an ambitious concrete platform to address both of these crises simultaneously.

Limiting climate change to the extent required by science will, according to the Intergovernmental Panel on Climate Change, "require rapid, far reaching, and unprecedented changes in all

[21] https://news.gallup.com/poll/244367/top-issues-voters-healthcare-economy-immigration.aspx.
[22] https://www.sciencedaily.com/releases/2018/07/180706102842.htm.

aspects of society, and could go hand in hand with ensuring a more sustainable and equitable society." This transformation must happen at the speed and scale demanded by scientific reality and the urgent need of our communities. If we do it right, we cannot only avoid the worst impacts of climate change, but also create quality, family-sustaining jobs and a more equitable society. Realizing these goals and getting to our carbon reduction targets is going to be challenging, but they are achievable, and public lands will play an essential role in achieving them.

We greatly appreciate this Committee's efforts to craft a bill that makes public lands a key climate solution. Our public lands have a critical role to play in carbon sequestration, in climate resilience, and in climate mitigation. Investment in our public lands could remove up to 21 percent of the current annual greenhouse gas emissions of the United States from the atmosphere.

Natural infrastructure, responsible resource development, and reclamation are just a few of the ways public lands could contribute to achieving our climate goals. I would like to talk about each of these needed investments.

First, the protection and restoration of natural infrastructure like watersheds, floodplains, and coastal barriers is vital to tackling climate change and creating jobs. Our parks and recreation facilities received a "D^+" grade from the American Society of Civil Engineers. Getting these facilities to a "B" grade over the next 10 years would support or create an estimated 632,000 job years across the U.S. economy.

Second, to meet our climate goals we need to expand America's clean energy sources. Development of wind and solar on public lands and waters has great potential to create jobs, while moving us toward the clean energy future needed to combat climate change. Offshore wind expansion is a demonstrable and very current example of this potential.

Finally, cleaning up abandoned mines and orphaned oil and gas wells can put people to work, remediating a host of environmental and public health problems, and also free up that land for new economic development opportunities.

These kind of strategic investments in natural infrastructure, in clean energy development, and in reclamation can ensure our public lands help us achieve our climate goals. And they must go hand in hand with measures to ensure these jobs are quality jobs, and that the workers and communities impacted have the tools and resources they need to make the shift to a clean energy economy.

America is already in the middle of an energy transition, as Governor Ritter pointed out. We need to have a conversation about getting ahead of this transition, and we need to do this now. We must diversify local and regional economies, and create and sustain quality economic opportunities. This includes increasing union density, providing a bridge of transition assistance for workers, and economic development assistance for communities.

In closing, I want to reiterate that tackling the crisis of climate change, if done right, is a significant opportunity to build a stronger and fairer economy, protect our environment, and create quality family-sustaining jobs across our economy. Given the scale of the

problem, numerous solutions will be needed, and public lands will have a key role to play.

Thank you again for the opportunity to testify today.

[The prepared statement of Mr. Walsh follows:]

PREPARED STATEMENT OF JASON WALSH, EXECUTIVE DIRECTOR, BLUEGREEN ALLIANCE

Thank you Chairman Grijalva, Ranking Member Bishop, and distinguished members of the Committee. My name is Jason Walsh, and I am the Executive Director of the BlueGreen Alliance, a national partnership of labor unions and environmental organizations. On behalf of my organization, our partners, and the millions of members and supporters they represent, I want to thank you for convening this hearing today on how we can make public lands part of a climate solution.

Our Nation faces the dual crises of climate change and increasing economic inequality. These crises are inextricably linked—as are their solutions. That's why this past summer, the BlueGreen Alliance, alongside our labor and environmental partners, released *Solidarity for Climate Action*, an ambitious, concrete platform to address these crises simultaneously, fighting climate change, reducing pollution, and creating and maintaining good-paying, union jobs across the Nation.[1] We need to plan for the future and American workers must be at the forefront of that discussion.

Limiting climate change to the extent required by science will, according to the Intergovernmental Panel on Climate Change (IPCC), "require rapid, far-reaching and unprecedented changes in all aspects of society," and "could go hand in hand with ensuring a more sustainable and equitable society."[2] This transformation must happen at the speed and scale demanded by scientific reality and the urgent need of our communities. If we do it right, we cannot only avoid the worst impacts of climate change, but create quality, family-sustaining jobs and ensure a more equitable society.

Achieving these goals and getting to our carbon reduction targets is going to be challenging but they are achievable, and public lands will play a critical role in achieving them.

One key strategy for tackling both climate change and the challenges of working people is robust investment in our public lands through natural infrastructure. Natural infrastructure involves the management of naturally occurring or naturalized landscapes to maximize ecosystem services for the purposes of water quality, flooding prevention, carbon sequestration, and climate resilience. On public lands, this includes addressing the public lands maintenance backlog, recovering America's wildlife, restoring forests and wildlands, reclaiming mines and wells, and improving climate resilience through natural defenses that act as carbon sinks. We appreciate the Committee's efforts to craft a technology-inclusive bill that makes public lands a key part of a climate solution.

THE ROLE OF PUBLIC LANDS IN MEETING CLIMATE GOALS

Our public lands have a critical role to play in carbon sequestration, and in climate resilience and mitigation. Public lands already capture 4 percent of all U.S. emissions,[3] and investments in natural infrastructure, responsible resource development, and reclamation are just a few of the ways public lands could contribute to achieving our climate goals. Investment in these natural systems—such as forest and wetlands restoration, better rangeland management, and restorative agriculture—could remove up to 21 percent of the current annual emissions of the United States from the atmosphere.[4]

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[1] BlueGreen Alliance, "Solidarity for Climate Action," June 2019. Available online: https://www.bluegreenalliance.org/work-issue/solidarity-for-climate-action/.

[2] IPCC, "Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by Governments," October 8, 2018. Available online: https://www.ipcc.ch/2018/10/08/summary-forpolicymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/.

[3] U.S. Geological Survey, *Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2005–14*, November 2018. Available online: https://pubs.usgs.gov/sir/2018/5131/sir20185131.pdf.

[4] Science Magazine, "Natural climate solutions for the United States," November, 14 2018. Available online: https://advances.sciencemag.org/content/4/11/eaat1869.

Public lands and waters provide carbon benefits while also providing other important benefits like clean water, flood control, outdoor recreation opportunities, and wildlife habitat. For example, forests and grasslands play a major role in the carbon cycle, acting as carbon sinks through the uptake and storage of carbon. National forests store an average of 69.4 metric tons of carbon per acre—a greater density than private forests [5] and equivalent to seven times annual U.S. emissions.[6] These areas, along with grasslands and other open space, also play a large role in our Nation's water quality—the water supply of 180 million Americans is captured and filtered by national forests and grasslands.[7]

America's public lands are noteworthy not just for their environmental importance. They are also an engine of sustainable economic growth and job creation to the Nation. In 2018, there were over 318 million visits to national parks.[8] These visitors play a huge role in local and national economies, contributing to both local jobs near park facilities as well as the broader outdoor recreation economy. The outdoor economy is an $887 billion industry in the United States—responsible for 7.6 million jobs—as well as $65.3 billion in Federal and $59.2 billion in state and local tax revenue.[9] According to the National Park Service (NPS), in 2018 park visitors spent $20.2 billion within 60 miles of NPS lands, supporting 329,000 jobs in rural gateway communities.[10] Similarly, activity on Forest Service lands supports more than 205,000 jobs with $11 billion in local economic impact.[11] One of the fastest growing parts of the U.S. economy, these levels of economic activity and jobs are only possible through the maintenance of healthy public land and water ecosystems.[12]

INVEST IN NATURAL INFRASTRUCTURE FOR RESILIENT COMMUNITIES AND ECOSYSTEMS

Healthy ecosystems are also a key component in building resilient human communities that can adapt to the impacts of climate change. One important strategy for making communities more resilient to climate change is the protection and restoration of natural infrastructure like watersheds, floodplains, and coastal barriers. Importantly, coastal ecosystems shield people and property from sea-level rise and storm inundation.[13] This natural infrastructure provides services like water storage and filtration, fisheries production, and carbon sequestration worth an estimated $125 trillion per year globally—significantly more than the annual output of the global economy.[14] The domestic ecological restoration industry—a broad sector including jobs from project planning and engineering, to on-the-ground earthmoving, forestry, and landscaping—employs 126,000 workers and generates approximately $9.5 billion in economic output annually.[15] Research shows that each dollar invested has a $15 return in economic benefits.[16]

Because of the health, ecological, and economic benefits of natural infrastructure approaches, cities across the country, including Seattle, Chicago, New York City,

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[5] U.S. Department of the Interior, *U.S. Forests and Carbon*, 2010. Available online: https://www.fia.fs.fed.us/forestcarbon/docs/forest%20carbon%20fact%20sheet%2020101012.doc.

[6] Sierra Club, *Forests, Wood, and Climate Report*. July 2019. Available online: https://content.sierraclub.org/ourwildamerica/sites/content.sierraclub.org.ourwildamerica/files/documents/Forests%2C%20Wood%20%26%20Climate%20Report_Sierra%20Club_July%202019.pdf?_ga=2.175164322.1625138360.1581451388-1946256526.1580745540.

[7] American Society of Civil Engineers, *Infrastructure Report Card: Public Parks*, 2017." Available online: http://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Parks-Final.pdf.

[8] National Park Service, "Visitation Numbers," 2018. Available online: https://www.nps.gov/aboutus/visitation-numbers.htm.

[9] Outdoor Industry Association, *The Outdoor Recreation Economy*, 2017. Available online: https://outdoorindustry.org/wp-content/uploads/2017/04/OIA_RecEconomy_FINAL_Single.pdf.

[10] National Park Service, *2018 Visitor Spending Report: Economic Contributions to Local Communities, States, and the Nation*, 2018, Available online: https://www.nps.gov/nature/customcf/NPS_Data_Visualization/docs/NPS_2018_Visitor_Spending_Effects.pdf.

[11] American Society of Civil Engineers, *Infrastructure Report Card: Parks, 2017*. Available online: http://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Parks-Final.pdf.

[12] U.S. Department of Commerce Bureau of Economic Analysis, "Outdoor Recreation Economy Grew Faster Than U.S. Economy in 2016," 2018. https://www.bea.gov/news/blog/2018-09-20/outdoor-recreation-grew-faster-us-economy-2016.

[13] Nature, "Coastal habitats shield people and property from sea-level rise and storms." 2013. Available online: https://doi.org/10.1038/nclimate1944.

[14] Robert Costanza, et al, *Changes in the Global Value of Ecosystem Services*, April 2014. Available online: http://community-wealth.org/sites/clone.community-wealth.org/files/downloads/article-costanza-et-al.pdf.

[15] Todd BenDor, et al, *Estimating the Size and Impact of the Ecological Restoration Economy*, 2015. Available online: https://doi.org/10.1371/journal.pone.0128339.

[16] Center for American Progress, *The Economic Benefits of Restoring Coastal Ecosystems*, April 2014. Available online: https://cdn.americanprogress.org/wp-content/uploads/2014/04/Coastal Restoration-factsheet.pdf.

Philadelphia, and Nashville have embraced these techniques as part of their stormwater infrastructure programs.[17] In Nashville, a citywide natural infrastructure plan identified potential runoff reductions of 3.5 billion gallons of water a year—a huge improvement for an area that annually sees 756 million gallons of sewer overflow into surrounding rivers and streams. The city is currently implementing projects on a public high school, farmers' market, neighborhood street right-of-way, and high-rise public housing for seniors, parks facility and a public works complex, with estimated runoff reductions ranging from 340,000 to over 6 million gallons a year.[18] If a full array of natural infrastructure techniques were adopted nationwide for new construction projects over an acre in size, the job creation potential is estimated at 84,000 direct, indirect, and induced jobs created and supported throughout the U.S. economy per year.[19]

These investments are also supporting local economies by creating jobs. Natural infrastructure, like all water infrastructure, must be installed and maintained correctly to be effective. Skilled workers are needed to ensure the installation and construction of natural infrastructure projects are effective and maintain water quality standards. In addition, natural infrastructure, along with traditional water systems, requires routine maintenance and upkeep to function optimally, thus sustaining job creation and employment opportunities.[20] All of these investments can reduce air and water pollution—including the emissions driving climate change—and make our communities more resilient to the impacts of climate change.

Despite the role that public lands play in our Nation's economic and environmental well-being, governing agencies at all levels are challenged to support these resources and our parks and recreation facilities receiving a "D+" grade from the American Society of Civil Engineers.[21] Getting our parks and recreation facilities to a "B" grade over the next 10 years could support or create an estimated 632,000 job-years across the U.S. economy.[22]

Across the country, cities and localities have increasingly been faced with declining state and Federal funding for parks. Chronic underfunding of National Park Service budgets has led to an $11.9 billion backlog of deferred maintenance at NPS sites and the United States Forest Service—which manages a vast series of national forests, grasslands, and other natural areas—also has a significant deferred maintenance backlog of $5.1 billion. These deficiencies present huge challenges to the agencies responsible for our public lands, and are only worsening as visitation remains high.[23] Bills that have moved through this Committee could help remedy this situation. The Restore our Parks and Public Lands Act (H.R. 1225) and the Land and Water Conservation Fund Permanent Funding Act (H.R. 3195) would boost local economies while protecting public lands.

RESPONSIBLE ENERGY DEVELOPMENT ON PUBLIC LANDS

In order to meet our climate goals, we need to expand America's clean energy sources. However, the U.S. Geological Survey estimates that current resource development on public lands currently accounts for 25 percent of our country's emissions.[24] Development of wind and solar on public lands and waters has great potential to create jobs while moving us toward the clean energy future needed to

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[17] Natural Resources Defense Council, *Rooftops to Rivers II: Green Strategies for Controlling Stormwater and Combined Sewer Overflows 2013 Update*, 2013. Available online: http://www.laondaverde.org/water/pollution/rooftopsii/files/rooftopstoriversII-update.pdf.

[18] American Society of Landscape Architects, *2013 Professional Awards: Green Infrastructure Master Plan*, 2013. Available online: https://www.asla.org/2013awards/410.html.

[19] BlueGreen Alliance, *Making the Grade 2.0: Investing in America's Infrastructure to Create High-Quality Jobs and Protect the Environment*. Available online: https://www.bluegreenalliance.org/resources.

[20] BlueGreen Alliance, *Clean Water, Good Jobs*, 2012. Available online: https://www.bluegreenalliance.org/resources/httpwww-bluegreenalliance-orgnewspublicationsclean-water-good-jobs/.

[21] American Society of Civil Engineers, *2017 Report Card for America's Infrastructure*, 2017. Available online: http://www.infrastructurereportcard.org/.

[22] BlueGreen Alliance, *Making the Grade 2.0: Investing in America's Infrastructure to Create High-Quality Jobs and Protect the Environment*. Available online: https://www.bluegreenalliance.org/resources/making-the-grade-2-0-investing-in-americas-infrastructure-to-create-quality-jobs-and-protect-the-environment/.

[23] American Society of Civil Engineers, *Infrastructure Report Card: Public Parks*, 2017. Available online: http://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Parks-Final.pdf.

[24] U.S. Geological Survey, *Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2005–14*, November 2018. Available online: https://pubs.usgs.gov/sir/2018/5131/sir20185131.pdf.

combat climate change. The expansion of offshore wind is a demonstrable example of this principle.

America's first offshore wind project at Block Island is a great model of this potential. This project was the result of years of collaboration between labor, environmental organizations, industry, and key government officials and entities. Its five turbines began generating power off the coast of Rhode Island at the end of 2016. They produce enough clean, local energy to power 17,000 homes.[25] Recently, Atlantic coast states have ramped up their interest in building out their offshore wind capacities. More and more state governments have begun passing laws to mandate the development of offshore wind. For example, Massachusetts has set a goal of 1,600 MW by 2027;[26] New York has mandated 9,000 MW by 2035;[27] New Jersey requires 3,500 MW by 2030;[28] and Rhode Island[29] and Connecticut[30] have also set similar (though smaller) commitments.

Though comparatively small, Block Island demonstrates the type of diverse, highly skilled workforce needed in the offshore wind industry. The project put more than 300 people to work and employed electricians, welders, ironworkers, pipefitters, pile drivers, engineers, scientists, vessel operators, lawyers, and sales representatives. America's offshore wind industry is growing dramatically and now has even larger projects in development in states like Connecticut, Maryland, Massachusetts, New Jersey, New York, and Rhode Island. This committed development has the potential to dramatically expand both clean energy and job creation in a relatively untapped sector.

In order to truly capture the full benefits and potential of these projects, it is critical that they are built by skilled workers who are paid family-sustaining wages, with project labor agreements in place, and with materials manufactured here in the United States. As the industry grows, sourcing components domestically represents a significant opportunity to help revitalize American manufacturing. The Special Initiative for Offshore Wind's recent white paper predicts an almost $70 billion buildout of U.S. offshore wind supply chain by calculating growth in a number of sectors, which include wind turbines and towers; turbine and substation foundations; upland, export, and array cables; onshore and offshore substations; and marine support, insurance, and project management.[31]

Responsible production, transparent and fair leasing decisions, and strong protections for the environment are crucial for any energy development on U.S. public lands and waters. We therefore support the development of science-based best management practices for renewable energy development. We should also consider smart ways to address issues with existing energy development. For example, many of the Bureau of Land Management's (BLM) fiscal and leasing policies regulating oil and gas drilling requirements on public lands are outdated. These policies carry negative implications for the U.S. taxpayer, costing revenue generation from leases, stifling reclamation efforts, and allowing the release of methane—a greenhouse gas roughly 80 times more powerful than carbon dioxide. Modernization of leasing, bonding, and fiscal policies would ensure fair returns for taxpayers, and protect workers and communities from the pollution and dangerous compounds—such as the carcinogen benzene—that accompanies unnecessary leaks.[32]

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[25] Deepwater Wind, "Block Island Wind Farm." Available online: http://www.dwwind.com/project/blockisland-wind-farm/.

[26] 4 State of Massachusetts, "Offshore Wind." Available online: https://www.mass.gov/servicedetails/offshore-wind.

[27] 5 New York State Energy Research and Development Authority, "Getting to 2035." Available online: https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-in-New-York-StateOverview/Getting-to-2035.

[28] State of New Jersey Department of Environmental Protection, Air Quality, Energy & Sustainability. "Offshore Wind." Available online: https://www.nj.gov/dep/aqes/offshorewind.html.

[29] 7 State of Rhode Island Office of Energy Resources, "Governor's 1,000 by '20 Clean Energy Goal." Available online: http://www.energy.ri.gov/renewable-energy/governor-clean-energy-goal.php.

[30] 8 State of Connecticut Department of Energy & Environmental Protection, "Gov. Malloy and DEEP Announce Selection of 250 MW of Renewable Energy Projects," June 13, 2018. Available online: https://www.ct.gov/deep/cwp/view.asp?A=4965&Q=603300.

[31] Stephanie A. McClellan, *Supply Chain Contracting Forecast for U.S. Offshore Wind Power*, March 2019. Available online: https://www.ceoe.udel.edu/File%20Library/About/SIOW/SIOW-White-Paper_SupplyChain-Contracting-Forecast-for-US-Offshore-Wind-Power-FINAL.pdf.

[32] Environmental Defense Fund, "Methane Pollution from the Oil & Gas Industry Harms Public Health." Available online: https://www.edf.org/sites/default/files/content/methane_rule_health_fact_sheet_reboot_final_no_citations.pdf.

RECLAMATION

Cleaning up abandoned mines and orphaned oil and gas wells in the United States is an example of how America's environmental challenges can also be economic opportunities. Reclamation not only remediates the host of environmental and public health problems associated with these sites, it also frees up that land for new, more sustainable economic development opportunities in industry sectors such agriculture, recreational tourism, manufacturing, and even clean energy production. Immediate job opportunities are also created doing the reclamation work.

The Abandoned Mine Land (AML) Program—created by Congress through the Surface Mining Control and Reclamation Act (SMCRA) in 1977—models the way that reclamation can contribute to both a clean environment and economic opportunities.

The AML program has reclaimed nearly 800,000 acres of damaged land and water across the country.[33] Over the course of its first 40 years, it eliminated over 46,000 open mine portals, reclaimed over 1,000 miles of dangerous highwalls, and protected 7.2 million people nationwide from AML hazards.[34] However, there are still over 5,000 abandoned coal mines across the country. According to the Office of Surface Mining Reclamation and Enforcement, it will cost at least $10 billion to reclaim the remaining high priority abandoned coal mines across the country. While a similar program does not exist for hardrock mines or oil and gas wells, the EPA estimates there are more than 1 million orphaned oil and gas wells throughout the United States.[35] The GAO estimates there are at least 161,000[36] abandoned hardrock mines throughout the country; others suggest there may be over 500,000.[37] Cleaning up these mines and wells not only reduces air and water pollution—including emissions driving climate change—but also continues to spur economic opportunities.

To date, the AML program has supported 4,761 direct jobs across the country, having a net impact of $450 million on U.S. gross domestic product in fiscal year 2013. In Central Appalachian states alone that year, the program supported 1,317 direct jobs and delivered a value-added impact of $102 million.[38]

While Abandoned Mine Land funds are used exclusively for reclamation of pre-1977 abandoned coal mines, reclaimed mine lands and the areas surrounding them have great potential to be reused as sites for new economic endeavors. Across the country, abandoned mine sites have been leveraged to create jobs through sustained revitalization efforts, wildlife habitat and restoration, and water quality improvement and spur new economic opportunities in these communities. For example:

- In Mingo County, West Virginia, a sustainable agriculture facility is being constructed on a reclaimed coal mine that will produce commercial-scale fish and vegetables for regional markets;
- Reclamation of an abandoned coal mine that had been leaking pollution into the North Branch Potomac River for decades in western Maryland paved the way for at least 13 commercial angling and whitewater boating outfitters to operate on the river, supporting more than 40 full-time jobs and resulting in an economic impact of nearly $3 million on the area;
- In Glenrock, Wyoming, a surface coal mine was converted into a 158-turbine wind farm that produces enough electricity to power 66,800 households;
- In Luzerne County, Pennsylvania, a business park was constructed on reclaimed mine land, which now employs over 4,500 people and is home to 39 companies, including Lowe's, FedEx Ground, and Men's Warehouse. While

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[33] Appalachian Citizens Law Center, *Abandoned Mine Land Program: A Policy Analysis for Central Appalachia and the Nation*, July 8, 2015. Available online: https://appalachian citizenslaw.files.wordpress.com/2015/07/exec-summary-abandonded-mine-reclamation.pdf.

[34] Pennsylvania Department of Environmental Protection, "AML Program Information: Abandoned Mine Reclamation in Pennsylvania." Available online: https://www.dep.pa.gov/Business/Land/Mining/AbandonedMineReclamation/AMLProgramInformation/Pages/default.aspx.

[35] U.S. Environmental Protection Agency (EPA), "Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2016: Abandoned Oil and Gas Wells," April 2018. Available online: https://www.epa.gov/sites/production/files/2018-04/documents/ghgemissions_abandoned_wells.pdf.

[36] U.S. Government Accountability Office, *Abandoned Mines: Information on the Number of Hardrock Mines, Cost of Cleanup and Value of Financial Assurances*. July 14, 2011. Available online: https://www.gao.gov/assets/gao-11-834t.pdf.

[37] Earthworks. 1993. *Burden of Gilt*. Available online: https://earthworks.org/publications/burden_of_gilt/.

[38] Appalachian Citizens Law Center, *Abandoned Mine Land Program: A Policy Analysis for Central Appalachia and the Nation*. July 8, 2015. Available online: https://appalachian citizenslaw.files.wordpress.com/2015/07/exec-summary-abandonded-mine-reclamation.pdf.

more industrial parks are not the economic solution for many rural communities, this example demonstrates that mine sites could be reclaimed for "brick and mortar" project applications like local businesses, job training facilities, and business incubators; and

- A project in Tuscarawas County, Ohio, is underway to transform a former mining site into a campground and trail system within Camp Tuscazoar's "Hidden Mine Recreation Area." The project will encourage visitors to stay in the area longer, generating more demand for secondary services. The campground is projected to generate direct revenue and contribute both directly and indirectly to the county's economy.[39]

Federal efforts such as the AML Pilot Program and the RECLAIM Act have been put forward that would expedite the use of existing funds in the Abandoned Mine Land Fund to reclaim abandoned coal mines and stimulate economic development on that reclaimed land. Not only would efforts like this benefit communities by restoring the natural environment, they would also invest long term in the economic diversification of these communities.

WE HAVE TO DO THIS ENERGY TRANSITION THE RIGHT WAY

If we do it right, we can create quality, family sustaining jobs while also reducing carbon pollutions and avoiding the worst impacts of climate change. Strategic investments in building the clean economy—such as in reclamation and clean energy on public lands—are critical, as are measures to ensure these jobs are quality jobs and that workers and communities impacted have the tools and resources they need to make the shift to a clean energy economy.

As we find solutions to climate change, it's important to improve the quality of jobs created, and it's also essential to provide the tools and resources necessary for workers to transition to good new jobs, to diversify local and regional economies, and to create and sustain quality economic opportunities. This energy transition is already happening. We need to have a conversation about getting ahead of this and we need to do this now.

American workers have faced wage stagnation, difficult working conditions, and a wholesale effort to decimate their ability to organize for the past several decades. Unionization offers the best pathway for quality jobs and more importantly a good, family sustaining livelihood. A commitment to a globally competitive social safety net and high-quality job creation across all sectors of the economy—but especially related to clean energy, adaptation, and resilience—will only be realized if we commit to:

- Increasing union density across the country through strong support of the right to organize throughout the economy, including in the clean technology sectors;
- Remove policy barriers to organizing and promote productive policies to ensure that workers have a meaningful voice on the job;
- Applying mandatory labor standards that include prevailing wages, safety and health protections, project labor agreements, community benefit agreements, local hire, and other provisions and practices that prioritize improving training, working conditions, and project benefits. This includes respect for collective bargaining agreements and workers' organizing rights such as neutrality, majority sign-up, and first contract arbitration for construction, operations, and maintenance;
- Raising labor standards through improved wages and benefits and the prioritization of full-time work that eliminates the misclassification of employees and misuse of temporary labor;
- Investing in training, equipment, preparedness, plan development, and other tools including through registered apprenticeship programs to ensure a robust, skilled, and well-prepared workforce to build the natural and clean technology infrastructure necessary to avoid and mitigate the most damaging impacts caused by climate change; and
- Maximizing the utilization and support for established training providers (such as registered apprenticeships, community colleges, and union training centers) and skill certifications for manufacturing.
- Effective and equitable access to high-quality employment, training, and advancement for all workers, particularly those from low-income households,

[39] Ibid.

those historically under-represented on the basis of race, gender, and other criteria, and those adversely impacted or dislocated by technological changes, notably those in trade, transportation and energy impacted communities;

- Guaranteed pensions and a bridge of wage support, health care, and retirement security until an impacted worker either finds new employment or reaches retirement;
- Dedicated community engagement including workers, community members, and leaders to support and enhance the development of the local economy;
- Massive economic investment in deindustrialized areas, including remediating any immediate loss of tax base or public service for communities;
- Mandated reclamation of closed and abandoned industrial sites to remediate deindustrialized blight, coupled with economic development and diversification; and
- Requirements for fair and safe working conditions throughout global supply chains.

CONCLUSION

In closing, I want to reiterate that tackling the crisis of climate change—if done right—is a significant opportunity to ensure a more equitable society, protect our environment, increase U.S. global competitiveness, and create quality, family-sustaining jobs across the country. Given the scale of the problem, numerous solutions will be needed and public lands will have to play a key role. We appreciate the Committee's efforts to make progress now. We look forward to working with this Committee as you move forward.

Thank you again for the opportunity to testify today.

QUESTIONS SUBMITTED FOR THE RECORD TO JASON WALSH, EXECUTIVE DIRECTOR, BLUEGREEN ALLIANCE

Questions Submitted by Rep. Grijalva

Question 1. What is BlueGreen Alliance's position on hardrock mining?

Answer. The BlueGreen Alliance sees a need for a new national commitment to environmentally, economically, and socially responsible mining, as well as reclamation and recycling of minerals and materials. This commitment is necessary with regards to hard rock mining, as existing policies are not sufficient to ensure responsible mining, and we are facing increasing demand for hard rock minerals as part of a transition to a clean economy. There is great potential to create jobs in America, generate a cleaner and more secure energy future and elevate the United States as a global leader in the industry. We can act now to enhance recycling, reclamation and increasingly circular process and product design and to forge a national agreement for better plan to produce necessary minerals and materials in ways that uphold our obligations to workers, communities and the environment.

The BlueGreen Alliance does not take positions on specific mining projects.

The CHAIRMAN. Now, I invite Mr. Marshall for your comments. Thank you, sir.

STATEMENT OF STEVE MARSHALL, SENIOR VICE PRESIDENT FOR POLICY, SMARTLAM NORTH AMERICA, WASHINGTON, DC

Mr. MARSHALL. Thank you, Mr. Chairman, and thank you, members of the Committee, for the opportunity to speak with you today.

Before I go into my prepared remarks, I want to say thank you for something else. For two sessions in a row here in Congress, the Timber Innovation Act was introduced and got very strong bipartisan support. The provisions of that Act did make it into the last Farm Bill. And I just want to tell you, as someone that is a practitioner on the wood products side of things—and I was working for

the U.S. Forest Service at the time—that was a huge shot in the arm for us—the work we were doing on sustainable wood products across the country. So, I just want to say thank you very much. There are people in this room that helped make that possible.

Now to my remarks today, I am going to be citing several times cross laminated timber. I have a sample of it here. It is a dimensional lumber glued together at right angles as a construction material. And I realize some people may not know what that is, so I just wanted to have a visual for you.

I am here to speak on behalf of SmartLam North America regarding the Trillion Trees Act. I offer my support for H.R. 5859 broadly, and specifically want to address its potential to impact sustainable building practices.

SmartLam North America is one of the few domestic producers of cross laminated timber, also known as CLT. We have factories in Montana and Alabama currently producing CLT. Our CLT has been used in buildings from coast to coast. It has been used by the Department of Defense in on-base lodging. If you go into Chicago, the new flagship restaurant in downtown Chicago has our CLT in it.

CLT and a series of sort of sister technologies that are similar are collectively known as mass timber. They have been widely recognized for their extraordinary potential to sequester carbon. They store carbon directly in the wood. They also offset emissions that other construction technologies would have that are greater than what you have when you use the CLT, particularly concrete. The construction industry is estimated to contribute about 23 percent of our domestic carbon emissions right now, so this is really directly dealing with one of our ongoing sources of carbon emissions.

The U.S. capacity to expand forests while harvesting for wood is very well established. If you look at the last 100 years of forest management and the expansion of forests in this country, while simultaneously producing billions and billions of dollars' worth of forest products, the two go hand in hand. They do not exclude each other.

I recently retired from the Forest Service. I was with the U.S. Forest Service for 41 years. The last 10 years I was with the agency, I led the agency's forest product market development work. Starting in 2013, we, as an agency, specifically identified cross laminated timber as the single product that we were aware of where we could have the greatest impact on multiple goals: the carbon sequestration, getting wood out of the forests that have become overstocked.

We have been very successful with putting fire out for the last 100 years. We are paying the consequences of that now in some parts of the country. We are seriously looking at how we can address the overstock, and what are products that can make it out of the wood. This is something that we saw paying its own way out.

The market development work has come along quite far. At this point, we have 256 mass timber buildings that are up in the United States, and there are another 458 that we are aware of that are in the planning process right now. This is moving. This is for an industry that did not exist in this country in 2013, when we started focusing on it.

I want to just put that out there. The carbon sequestration aspects are the primary driver on this. When you talk to the key players around the world that are focused on this technology, it is the carbon that is driving it. The projects have to make it on an economic basis, but it is carbon, carbon, carbon that is bringing people to the table.

The tax provisions that are in the H.R. 5859, I think, are potentially very powerful. And it was interesting to me. It doesn't say tax provisions for wood. It is talking about tax provisions, essentially, for a more sustainable building, as a whole. I happen to believe wood will be very competitive in that context. But it was refreshing to see it wasn't prescribing how to do it, it just sort of puts out the opportunity, sets out the goal.

Thank you very much.

[The prepared statement of Mr. Marshall follows:]

PREPARED STATEMENT OF STEVE MARSHALL, SENIOR VICE PRESIDENT FOR POLICY, SMARTLAM NORTH AMERICA

Mr. Chairman, thank you and the Committee members for this opportunity to speak to you on behalf of SmartLam North America regarding The Trillion Trees Act. It is an honor to be here with you today talking about trees and the role they can play as we deal with climate change. I offer my support of H.R. 5859 broadly and want to specifically address its potential to impact sustainable building practices.

SmartLam North America is one of the few domestic producers of cross laminated timber also known as CLT. We make it in Montana and Alabama. Our CLT has been used in buildings from coast to coast in projects as diverse as on-base military guest housing and in the new flagship McDonalds restaurant in Chicago.

CLT and some related wood technologies known together as "mass timber" have been widely recognized for the extraordinary opportunity they present to sequester carbon. These technologies provide for sustainable building construction. Not only do they directly store carbon by using wood, they also offset carbon emissions related to various other construction materials in wide use, most notably concrete. The U.S. capacity to expand forests while harvesting wood for wood products is well established. This history makes the case for the related provisions in H.R. 5859.

Last December I retired from the U.S. Forest Service following 41 years of service. One of my responsibilities while working for the Agency was wood product market development. My current employment with SmartLam follows a similar path.

In 2013, while with the Forest Service, I conducted a review of wood technologies looking for what would be the most promising area for near-term wood product market development. Out of the dozen or so technologies considered, one stood out as having enormous potential and market readiness. That was CLT for building construction.

At the time, CLT was better than a decade into market development in Europe. It had recently been used in Australia and was beginning to be used in Canada. The only U.S. CLT production back then was SmartLam's small-scale production of industrial mats being used in oil fields to keep trucks and other heavy equipment up out of the mud.

In August 2013, the Forest Service created the Wood Innovations program to help bring a strategic focus to its long-standing wood product market development efforts. While the program engages in a wide range of wood products, CLT and related forms of mass timber have been treated as a national priority. We had the good fortune of good timing. The mass timber sector has taken off. The primary driver of the market for these products is carbon.

Since 2013, 256 mass timber buildings have been completed in the United States and another 458 are currently in design phases. CLT production is taking place in Alabama, Arkansas, Illinois, Montana, Oregon, Texas, Utah, and Washington. Some of that is industrial matting, much of it is architectural grade CLT being used in buildings. The 2021 edition of the International Building Code used across the United States has specific provisions for accommodating CLT beyond what is currently specified in our building codes. Multiple states and cities have moved out to pre-commit to the 2021 code revisions. This is extraordinary momentum for a technology that essentially did not exist here in 2013.

Yet the challenges for this building sector moving ahead remain considerable. There is only a very limited amount of U.S. production—much of what is currently being used here is being built with imported CLT. There is very limited expertise available at every point in the value chain. For example, beyond the obvious needs for seasoned architects, engineers, and developers, there are extra costs today associated with the lack of familiarity that lenders, insurers and local code officials have with this material. Similarly, there are significant issues when applying conventional life cycle analysis methods to new products. So, we have a new technology that is rapidly moving along yet is dealing with multiple hurdles.

The tax provisions in H.R. 5859 have the potential to significantly impact the sustainability of our construction practices in the United States. Recognizing the carbon involved in producing building materials and embedded in those materials is key. I would expect CLT and other forms of mass timber to compete very well in such a framework. (NOTE: The summary of the proposed Bill indicates benefits would apply only to domestically produced materials. I did not see that specified in the Bill text itself.)

In sum, we have a building technology with the potential to transform the carbon profile of our built environment. As we grow our sustainable forests, we can further sequester carbon captured by these forests for generations to come.

Thank you for your time today and I am happy to respond to questions.

The CHAIRMAN. Thank you for your comments.

Let me now recognize Carla Staver for your comments.

STATEMENT OF CARLA STAVER, ASSOCIATE PROFESSOR, ECOLOGY AND EVOLUTIONARY BIOLOGY, YALE UNIVERSITY, NEW HAVEN, CONNECTICUT

Dr. STAVER. Thank you very much, Chairman Grijalva, Ranking Member Bishop, and the Members.

On average, the global climate has already warmed by about 1° Celsius above pre-industrial levels. That is 1.5°–2° Fahrenheit. Formerly unprecedented climate extremes, from droughts to deluges to heatwaves, are becoming commonplace. One need only look at recent wildfires in Australia, the Amazon, and closer to home in Texas and California to see that climate extremes can be catastrophic.

The scientific consensus is that our changing climate is the direct result of anthropogenic fossil fuel—anthropogenic carbon emissions. These carbon emissions derive primarily from burning fossil fuels including oil, coal, and natural gas, and, to a lesser extent, from deforestation and other land use change.

I am an Earth scientist with a long-standing interest in these issues. I am an Associate Professor of Ecology at Yale University, and I have been studying the ecology of trees for more than 15 years. On a professional level, it is immensely cheering to see the climate crisis receiving the bipartisan attention that it has long deserved. And I commend this Committee for taking the lead in that action. It is truly exciting to see that, as somebody who is interested in climate and in ecology.

These discussions are a necessary first step toward the type of action on climate that can and will reverse the climate crisis. Action on climate should include diverse approaches, including forest restoration and prevention of deforestation, but must rely fundamentally on reducing emissions at the source via decreasing our dependence on fossil fuels.

So, it is really easy to understand the appeal of forest as a solution to the climate crisis. According to proponents of tree planting,

the forests supposedly offer a win-win-win, combining carbon drawdown, conservation, and forestry sector productivity, while also sparing us the necessity of difficult changes in our lifestyles and economy.

Although the idea is an old one, tree planting has gained prominence recently following a 2019 study and subsequent press campaign claiming that trees may sequester up to 205 gigatons of carbon, offsetting a whopping two-thirds of total historical anthropogenic carbon emissions. If you prefer, that is equivalent to sequestering carbon from about 20 years of fossil fuel emissions at current rates.

Unfortunately, like most things that seem too good to be true, it is. These estimates are wrong, and have been widely and swiftly disputed by the scientific community. In reality, planting trees and restoring forests offer a total carbon sequestration potential of about 42 gigatons of carbon, equivalent to only about 1/15, or 7 percent of total historical emissions. That is equivalent to 4 years of carbon emissions from fossil fuels at current rates. That is a lot less.

These revised estimates make it abundantly clear that forest restoration alone is not the silver bullet to solve the climate crisis. Long-term emissions reductions, and ultimately net zero emissions, must rely on reducing fossil fuel use itself.

So, why are the realistic numbers so much lower? First of all, it is not just trees that store carbon. Globally, soils store about three to five times more carbon than plants. Plus, not all plants are trees. So, an exclusive focus on wood is altogether too narrow, and misses carbon already stored in a lot of systems for tree planting. By analogy, if you want to fill a bucket, but it is already three-quarters full—with carbon, for instance, in soils—you can only add an additional quarter to the bucket. Inflated estimates mistakenly count the full bucket as new storage, when actually you can only really count a quarter of the bucket.

Second, it is a mistake to plant forests in places they don't belong. We call this afforestation, and a lot of areas targeted for afforestation are at high risk of drought, water shortages, and fires. And climate change is likely to increase those risks. In straightforward terms, returning carbon to the biosphere can sequester only as much carbon as was there to begin with.

I would also like to talk a little bit about another issue, which is that carbon capture by forest is slow. So, this is not about stocks, but this is about rates. It takes trees a while to grow. In tropical forests, which grow faster than any other forests on Earth, it takes a forest about 30 years to accumulate the carbon stocks that occur in a mature, primary forest. And in temperate and boreal systems, that is much, much slower.

What this means is that the major benefits of ramping up forest restoration will only accrue after 2030 and beyond. This is too slow and too late to help achieve 1.5° warming targets.

The flip side is that decreasing deforestation now will have immediate effects now, since avoiding deforestation reduces carbon emissions. Avoiding deforestation should always be the priority when we are talking about forest management.

In summary, tree planting alone does not offer a viable solution to the ongoing climate crisis. Forests absolutely have a role to play. Any plausible attempt to limit climate change within our life spans depends on avoiding further deforestation, and on appropriate and responsible forest restoration and management. However, it is also crystal clear that tree planting alone will not fix our ongoing climate emergency.

Our primary focus must be on reducing our dependence on fossil fuels. The illusion that tree planting is a silver bullet solution to the climate crisis is a distraction from real action. Thank you.

[The prepared statement of Dr. Staver follows:]

PREPARED STATEMENT OF DR. A. CARLA STAVER, ASSOCIATE PROFESSOR, DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY, YALE UNIVERSITY

On average, the global climate has already warmed by ~1°C above pre-industrial levels. Formerly unprecedented climate extremes—from droughts to deluges to heat waves—are becoming commonplace. One need only look to recent wildfires in Australia, the Amazon, and closer to home in Texas and California to see that climate extremes can be catastrophic. The scientific consensus is that our changing climate is the direct result of anthropogenic carbon emissions. These carbon emissions derive primarily from burning fossil fuels, including oil, coal, and natural gas, and, to a lesser extent, from deforestation and other land use change.[2]

Current business-as-usual emissions are projected to result in average warming of 2°C by the year 2050 and 3–4.5°C by the year 2100.[1,2] Staying below 1.5°C of warming looks increasingly ambitious, relying on reductions in total global greenhouse gas emissions of 45 percent by 2030 and net zero emissions by 2055.[3] Meanwhile, the difference between 1.5°C and 2°C total warming is associated with increased risks of extreme events and adverse social and economic consequences,[3] and even achieving 2°C will require deeper cuts to emissions than are currently pledged under the Paris Agreement.[1]

As an Earth scientist with a long-standing interest in these issues, it is immensely cheering to see the climate crisis receiving the bipartisan attention that it has long deserved. This is a necessary first step toward the type of action on climate that can and will reverse the climate crisis. Action on climate should include diverse approaches, including forest restoration and prevention of deforestation, but must rely fundamentally on reducing emissions at the source via decreasing our dependence on fossil fuels.

It is easy to understand the appeal of forests as a solution to the climate crisis. According to proponents of tree planting, forests putatively offer a win-win-win, combining carbon drawdown, conservation, and forestry-sector productivity, while also sparing us the necessity of difficult changes in our lifestyles and economy. Although the idea is an old one, tree planting has gained prominence recently following a 2019 study[4] and subsequent press campaign claiming that trees may sequester up to 205 gigatons of carbon, offsetting as much as two-thirds of total historical anthropogenic carbon emissions or, alternately, sequestering carbon from 20 years of carbon emissions at current rates. Like most things that seem too good to be true, it was. These estimates are wrong and have been widely disputed,[5,6,7,8] but have nonetheless gained traction in a political climate desperate for solutions to the increasingly urgent challenge of anthropogenic climate change.

Here, I elaborate on the main problems with focusing on trees as the only solution to climate change. First, forestation is risky, especially outside the historic range of forests. Second, carbon sequestration by forests is slow. And third, even in the best-

[1] Hausfather, Z. & Peters, G. 2020. Emissions—the 'Business as Usual' story is misleading. *Nature* 577:618–620.
[2] IPCC. 2013. *Climate Change: The Physical Science Basis*.
[3] IPCC. 2018. *Global Warming of 1.5°C: Special Report*.
[4] Bastin, J.F., *et al*. 2019. The global tree restoration potential. *Science* 365:76–79.
[5] Lewis, S., *et al*. 2019. Comment on 'The global tree restoration potential'. *Science* 366: 388–4.
[6] Veldman, J., *et al*. 2019. Comment on 'The global tree restoration potential'. *Science* 366:7976–5.
[7] Friedlingstein, P., *et al*. 2019. Comment on 'The global tree restoration potential'. *Science* 366:8060–3.
[8] Various. 2019. Letters on 'The global tree restoration potential'. *Science* 366:1–5.

case scenario, the reality is that mitigating fossil-fuel emissions by planting trees (or even via nature-based solutions more generally) is not enough. Any plausible solution to the climate crisis must fundamentally rely on burning less fossil fuels. In more detail:

1. Forestation is risky.

The growth and persistence of trees, once they are planted or regenerate, is a key consideration in estimating the potential of forests and plantations for emissions mitigation. Tree mortality can be substantial (>90 percent, depending on age and species), even in environments that favor forest establishment, and geographic targets for tree planting often include areas that historically are not forested (including tree planting proposals from the UNEP as referenced in H.R. 5859) and may not be appropriate for sustainably supporting forests.

Forest restoration is usually considered to be more successful when forests are allowed to regenerate naturally.[9] Trees survive at higher rates, resulting in more diverse forests and increasing carbon storage, although note that ecological processes depend heavily on forest type and that post-planting investment in tree survival tends to improve outcomes (especially appropriate in, *e.g.*, agricultural or urban contexts).[10] Facilitating natural forest regeneration and avoiding deforestation are therefore broadly considered more effective for storing carbon than artificially re-planting trees.

Afforestation exacerbates these issues. Afforestation is defined as the establishment of forests in places where they did not occur in the recent past, whereas reforestation is defined as the re-establishment of forests in places where they once occurred but were deforested. Afforestation increases the risk of tree mortality and exacerbates adverse effects including, *e.g.*, downstream water shortages and extreme fire risks, resulting in economic and infrastructure costs, as well as costs to human life. Crucially, species and ecosystem ranges are defined not only by average environmental conditions, but also by, *e.g.*, droughts, which are increasing in their frequency and are strongly associated with tree mortality[11] and fires.[12] Outside their range, therefore, the risks increase dramatically that major investments in afforestation will fail to store carbon in the medium and long term.

Future climate change will exacerbate these risks; for example, fire extent in western U.S. forests has already increased in area by a factor of 5 since the 1980s.[12] To mitigate these risks, we must manage forests explicitly for carbon storage and explicitly account for a changing climate, taking into account effects of, *e.g.*, aridification/drought and fire.

Polar regions come with special risks from afforestation. Far from cooling the climate, polar forests have a net warming effect on local climate because they increasing absorbance of solar radiation[13,14] (*i.e.*, snow is lighter in color than evergreen trees and therefore absorbs less heat). Although forests at low latitudes cool the climate via carbon storage, forests in polar regions instead increase local temperatures by almost 1°C in a region already subject to faster warming than anywhere else on Earth. From a national perspective, this is most relevant in Alaska and in mountains with substantial winter snowpack.[14] More broadly, focusing on carbon dioxide alone is insufficient. Rather, an explicit focus on climate change is necessary to tackle the climate crisis. In the context of the legislation under discussion, H.R. 5859 proposes to remove language from the Forest and Rangeland Renewable Resources Planning Act that aims to "mitigate the buildup of atmospheric carbon dioxide and reduce the risk of global climate change"; this language should be retained, since it keeps the focus explicitly on reducing the risk of climate change, instead of on wood production.

Finally, reducing deforestation and forest restoration are laudable activities. However, avoiding afforestation will also help to avoid risks that compromise long-term carbon storage goals; differentiating between reforestation and afforestation is crucial. Note that, throughout, H.R. 5859 treats afforestation and reforestation as

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[9] Crouzeilles, R., *et al*. 2017. Ecological restoration success is higher for natural regeneration than for active restoration in tropical forests. *Science Advances* 3:1701345.

[10] Reid, J., *et al*. 2018. Positive site-selection bias in meta-analyses comparing natural regeneration to active forest restoration. *Science Advances* 4:9143.

[11] Anderegg, W., *et al*. 2013. Consequences of widespread tree mortality triggered by drought and temperature stress. *Nature Climate Change* 3:30–36.

[12] Abatzoglou, J. & Williams, A.P. 2016. Impact of anthropogenic climate change on wildfire across Western U.S. Forests. *PNAS* 113:11770–11775.

[13] Lee, X., *et al*. 2011. Observed increase in local cooling effect of deforestation at higher latitudes. *Nature* 479:384–387.

[14] Chapin, F.S., *et al*. 2005. Role of land-surface changes in arctic summer warming. *Science* 310:657–60.

equivalent, which is likely to exacerbate risks and compromises carbon storage goals. I would also urge the inclusion of scientists in any National Reforestation Task Force to ensure that locations for reforestation are appropriate.

2. Forest regeneration is slow.

Trees grow slowly. Exactly how slowly depends on their environment, but carbon from forestation will everywhere accumulate later than currently projected—too late to appreciably change climate in the short term.

Even successful forest regeneration takes decades to centuries to recover the carbon storage potential of mature primary forests, depending on environmental context. In tropical forests, degraded agricultural landscapes regain the carbon storage potential in biomass of mature forests after a few decades of regrowth,[15] although soil carbon takes longer to recover; however, carbon accumulation is slower in temperate forests and even slower in evergreen boreal forests, where forests achieve their full carbon storage potential after only a century or more.[16] Nowhere is planting trees or regenerating forests an immediate solution to the problem of carbon emissions, and the major benefits of any current accelerated investment in forest restoration will only ramp up after 2030 and beyond. This is too slow and too late to help achieve 1.5°C warming targets, but may help to achieve medium- and long-term cuts to net emissions.

By contrast, slowing rates of deforestation now will have immediate effects, since avoiding deforestation reduces carbon emissions now. Avoiding deforestation will help hit short- and medium-term climate change targets, and should be a priority.

3. Trees are not enough.

An exclusive focus on trees and forests ignores the potential of a broader range of 'nature-based solutions' to the climate crisis. Specifically, it's not just trees that store carbon. Carbon is stored in other types of plants and in soils, as well. In some systems, most notably peatlands, decomposition is extremely slow and carbon builds up in soils. Eventually, total ecosystem carbon can vastly exceed that stored in nearby forests. In the United States, peatlands are concentrated in boreal and tundra regions of Alaska. Globally, peatlands are at risk of extreme fires, especially when forestry and development activities drain and disturb soils, resulting in substantial carbon emissions.[17] For instance, in 1997, Indonesian peat fires emitted between 0.81 and 2.57 gigatons of carbon, equivalent to 15–40 percent of annual global fossil fuels emissions.[18] As such, peatlands deserve explicit attention for their carbon storage potential, especially focused on keeping carbon in the ground.

Grasslands can also store substantial carbon in soils. In grasslands like the Argentinian pampa or North American prairie, encroachment by trees has been estimated to reduce total ecosystem carbon by as much as 45 percent.[19] This happens because the losses of carbon in soils are greater than the gains of carbon stored in trees. Curiously, carbon losses from tree encroachment are highest in wetter grasslands, where trees are usually considered most viable. Clearly, some open ecosystems should be considered alongside forests for restoration to promote carbon sequestration.

The issue of non-tree carbon also highlights one of the main limitations of recent estimates of the potential of trees to sequester carbon.[6] Many ecosystems identified as targets for tree planting already store substantial carbon, but existing carbon is sometimes neglected in calculations of the carbon gains associated with tree planting. (For a simple example, consider the following: If you want to fill a bucket, but it is already ¾ full, you can only add an additional ¼ to the bucket. Some estimates mistakenly count the full bucket as new storage potential, when in fact you can only really count ¼ of a bucket as new storage.) This substantially biases estimates and tends to suggest that trees store more carbon than they actually do. Elements of H.R. 5859 share this limitation; for instance, the 'Lifecycle Analysis' in Section 103b focuses too narrowly on carbon stored in wood, ignoring other components of ecosystem carbon and on carbon costs to transportation, production, etc., which are substantial.

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[15] Batterman, S., *et al*. 2013. Key role of symbiotic dinitrogen fixation in tropical forest secondary succession. *Nature* 502:224–9.

[16] Goulden, M., *et al*. 2011. Patterns of NPP, GPP, respiration, and NEP during boreal forest succession. *Global Change Biology* 17:855–871.

[17] Turetsky, M., *et al.* 2014. Global vulnerability of peatlands to fire and carbon loss. *Nature Geoscience* 8:11–14.

[18] Page, S., *et al*. 2002. The amount of carbon released from peat and forest fires in Indonesia during 1997. *Nature* 420:61–65.

[19] Jackson, R., *et al*. 2002. Ecosystem carbon loss with woody plant invasion of grasslands. *Nature* 418:623–626.

Correcting estimates of the global potential for tree planting to sequester carbon yields an estimate of potential carbon sequestration that is 80 percent less[6] than recent estimates,[4] for a total carbon sequestration potential of ~42 gigatons of carbon. This is in fact equivalent to only 1/15 of total historical emissions, or 4 years of carbon emissions from fossil fuels at current rates. These revised estimates make it abundantly clear that forest restoration alone is not the silver bullet to solve the climate crisis, and that long-term emissions reductions (and, ultimately, net zero emissions) must rely on reductions in fossil fuel use itself.

These corrected estimates are based on up-to-date estimates of tree viability, net cooling potential of forestation, soil carbon stocks, and qualitative evaluations of fire and water risk. But there's a simple way to build this intuition. Returning carbon to the biosphere can sequester only as much carbon as was in the biosphere to begin with. This means that restoring forests can sequester all the carbon emitted by deforestation but not also that emitted by fossil fuels (a much more substantial flux).[5] To return to the bucket analogy: if the pre-industrial biosphere is a bucket, it was once full of carbon that was released via changing land use and deforestation. We can put carbon back in the bucket to reverse those effects, but we can't hope that the biosphere bucket will hold not only its own contents, but also those of *another separate* fossil-fuel bucket. The analogy isn't perfect (e.g., we could debate whether the bucket was full to begin with and whether the size of the bucket is changing), but it's a useful first approximation.

In summary, tree planting alone does not offer a viable solution to the ongoing climate crisis. Forests do have a role to play: Any plausible attempt to limit climate change within our life spans depends on avoiding further deforestation and on appropriate and responsible forest restoration. However, it is also crystal clear that tree planting alone will not fix our ongoing climate emergency. Our primary focus must be reducing our dependence on fossil fuels. The illusion that tree planting is a silver-bullet solution to the climate crisis is a distraction from real action.

The CHAIRMAN. Let me now invite our last panelist for your comments.

Mr. Hollie.

STATEMENT OF DERRICK HOLLIE, PRESIDENT, REACHING AMERICA, BENNSVILLE, MARYLAND

Mr. HOLLIE. Greetings, Chairman. It is good seeing you again. And Ranking Member Bishop and members of the Committee, thank you for the opportunity to speak. I am Derrick Hollie, President of Reaching America, an educational policy organization I developed to address complex social issues impacting the African-American community. And one of the issues that we address the most is reducing energy poverty.

Energy poverty exists when low-income families or individuals spend sometimes upwards of 25 to 30 percent of their total income on their electric bill. And when that happens, it puts people in a very difficult situation, having to make tough choices like do I eat today or put gas in a vehicle? Do I get a prescription filled or do I pay the electric bill? And, unfortunately, we all know someone who faces these challenges every single day.

But for members of minority, rural, low income, and senior citizen communities, energy poverty is a reality. And, unfortunately, members of our community don't have the luxury to pay more for green technologies. And going green is not the most glaring issue in our community. We need access to affordable energy to help heat our homes, power our stoves, and get back and forth to work each day.

Through Reaching America, I have had the opportunity to speak to thousands of African-Americans in several states who question

the rising cost of energy, along with the fees and subsidies that most would never benefit from, and how they struggle to keep up.

My passion for energy is deeply rooted. After graduating from college, I worked as a brakeman for Norfolk Southern Railways at Lambert's Point Terminal in Norfolk, Virginia. Our job and responsibility was loading coal ships that transported coal all around the world. Last year, booming shale production here in the United States helped the United States become the world's top oil exporter. And I have asked myself the question many times: How can our natural resources be worthy enough to supply other countries, but not good enough for us, right here at home?

My grandfather was also a black coal miner in southwest Virginia. I had the opportunity to visit southwest Virginia last year and I have never seen poverty at that level. Many of the proposed suggestions of H.R. 5435 are unproven, and implementing a policy like this will result in thriving energy communities around the country mirror the poverty that exists in southwest Virginia and other Appalachian communities.

When the government creates policy, its first priority should be the welfare of the people, especially those impacted the hardest, rather than big business and special interest groups. And if people can't afford to stay warm, they certainly can't afford health care and basic needs, especially those on a fixed income.

And here's a real life example. About 2 weeks ago, my 84-year-old mother-in-law, on a fixed income, was at our house. She was complaining about a $150 deductible on a prescription that needed to be filled, in addition to her electric bill that includes renewable mandates, a subsidy that she is required to pay and will never benefit from right here in the District of Columbia. My mother-in-law has three daughters that help her. However, millions of Americans don't have that benefit, and are forced to try to balance paying for health care and energy. And most have to choose between one or the other.

A new study out of northwest Virginia confirms that increases in electricity and natural gas prices lead to more winter deaths. The effects were even larger among poor, as families are forced to choose between putting food on the table, health care, and staying warm. And with the amount of affordable and reliable energy in America, these are choices that no one should have to make.

It would be helpful to have impact assessment statements before any regulation is passed. This would be a major step toward increasing economic opportunities, and having input from governors and community leaders in the same way qualified opportunity zones were created. It would also establish a level of trust that has never existed before.

After all, the government requires environmental impact statements to estimate the effects on projects like roads and buildings on nature. Shouldn't the government act similarly when it comes to how regulations will impact a particular population?

H.R. 5435 establishes an advisory committee, including public interest groups. I would respectfully ask the Chairman, Mr. Chairman, that our organization, the Energy Poverty Project, be a part of the committee to serve as a voice for those impacted the

most in low income, rural, minority, and senior citizen communities.

A minority impact assessment would create a list of all positive and negative impacts a proposed regulation would have on these communities.

We need a market-oriented energy policy that will allow America to keep exploring and developing our resources safely, and to follow the example of environmental stewardship set by areas like Port Fourchon, Louisiana. The port serves as a major oil and gas hub for the Gulf Coast, and it is also a commercial fishing Mecca that continues to amaze scientists and researchers from around the world.

CO_2 emissions are down because of America's shift toward natural gas. And right now, according to a *New York Times* article published on June 19, 2019, our air quality in America is the best it has ever been in decades.

In closing, I don't dispute climate change. And as a licensed boat captain, I am all for protecting the environment, our waterways, and clean energy. However, until we figure out a way to harness the sun, the wind, and water to sustain ourselves, we need to use the natural resources we have, especially if it can lower energy costs, continue to create jobs, boost the economy, and allow for adequate health care and basic needs for Americans.

Thank you.

[The prepared statement of Mr. Hollie follows:]

PREPARED STATEMENT OF DERRICK HOLLIE, PRESIDENT OF REACHING AMERICA

Ranking Member Bishop and members of the Committee, thank you for this opportunity to speak.

I'm Derrick Hollie, president of Reaching America, an education and policy organization I developed to address complex social issues impacting African American communities. One of the issues Reaching America does the most work on is reducing energy poverty.

Energy Poverty exists when low income families or individuals spend up to 30 percent of their total income on their electric bill. And when this happens, it puts people in a difficult situation and having to make tough choices like, do I eat today or pay the electric bill? Do I get this prescription filled or do I put gas in my car? We all know someone who faces these tough choices every single day.

For members of minority, rural, low income and senior citizen communities, Energy Poverty is a reality. And unfortunately, members of our community don't have the luxury to pay more for green technologies and going green is not the most glaring issue in these communities. We need access to affordable energy to help heat our homes, power our stoves and get back and forth to work each day.

Through Reaching America I've had the opportunity to speak with thousands of African Americans in several states who question the rising cost of energy along with fees and subsidies that most will never benefit from and how they struggle to keep up.

My passion for energy is deeply rooted. After graduating from college I worked as brakeman for Norfolk Southern Railways at Lambert's Point in Norfolk, Virginia. Our job and responsibilities was loading coal ships that transported coal all around the world. Last year booming shale production helped the United States become the world's top oil exporter. And I've asked the question many times, how can our natural resources be worthy enough to supply other countries, but not good enough for us here at home?

My grandfather was a black coal miner in southwest Virginia. I visited southwest Virginia last year and I've never seen poverty at that level. Many of the proposed suggestions and ideas of H.R. 5435 are unproven and implementing a policy like this would result in thriving energy communities around the country mirror the poverty that exists in southwest Virginia and other Appalachian communities.

When the government creates policy, its first priority should be the welfare of the people, especially those impacted the hardest, rather than big businesses and

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A new study out of Northwestern University confirms that increases in electricity and natural gas prices lead to more winter deaths. The effects were even larger among the poor, as families are forced to choose between putting food on the table, health care, and staying warm. With the amount of affordable and reliable energy in America, these are choices we shouldn't have to make.

It would be helpful to have a "Impact Assessments" before any regulation is passed. This would be a major step toward increasing economic opportunities. And having input from governors and community leaders the same way "Qualified Opportunity Zones" were created. It will also establish a level of trust in communities that never existed before.

After all, the government requires environmental impact statements to estimate the effects of projects like roads and buildings on nature. Shouldn't the government act similarly when it comes to how regulations impact the population?

H.R. 5435 establishes an advisory committee including public interest groups. I would ask respectfully of Mr. Chairman that our organization The Energy Poverty Project be a part of the committee to serve as a voice for those impacted the most in low income, rural, minority and senior citizen communities.

A minority impact assessment would create a list of all the positive and negative impacts a proposed regulation would have on factors including employment, wages, consumer prices and homeownership. This regulatory impact would then be analyzed for its effect on minorities and other communities mentioned in contrast to the general population.

We need market-oriented energy policy that will allow America to keep exploring and developing our resources safely, and to follow the example of environmental stewardship set by areas like Port Fourchon, Louisiana. The port serves as a major oil and gas hub on the Gulf Coast. It's also a commercial and fishing Mecca that continues to amaze scientists and researchers from around the world.

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In closing, I don't dispute climate change and as a licensed boat captain, I'm all for protecting the environment, our waterways and clean energy however until we figure out a way to harness the sun, wind and water to sustain ourselves, we need to use the natural resources we have especially if it can lower energy cost, continue to create jobs boost the economy, allow for adequate health care and basic needs.

QUESTIONS SUBMITTED FOR THE RECORD TO DERRICK HOLLIE, PRESIDENT, REACHING AMERICA

Mr. Hollie did not submit responses to the Committee by the appropriate deadline for inclusion in the printed record.

Questions Submitted by Rep. Bishop

Question 1. In your testimony, you raise the idea of requiring analysis of economic impacts on minority communities to accompany legislation, similarly to how environmental impact assessments are required today. What metrics would need to be included in such an assessment to account for the impacts of bills like H.R. 5435 on communities struggling with energy poverty?

Question 2. In your testimony, you explain that energy poverty exists when families spend up to 30 percent of their total income on their electric bill and that, more and more, these families are also expected to pay green energy subsidies. Can you give us some examples of these subsidies and will these communities realize the outcome of paying these requirement payments?

Question 3. In recent years, municipalities have filed numerous lawsuits against individual conventional energy companies citing their perceived contributions to climate change. Do these lawsuits have any direct impact on carbon emissions or help low income communities in any way? Further, wouldn't it be more effective to advance practical policy solutions that could actually make a difference in reducing carbon emissions or supporting local communities?

Question 4. You mention the struggle of many low-income communities to heat their homes, and how increased prices of natural gas and electricity exacerbate this problem, especially in extreme weather. Could you explain what effect an entirely renewable electric grid would have on electricity prices?

Question 5. You mention in your testimony the staggering poverty in parts of Appalachia. What impact has the downturn in the coal industry had in this region, and what can this experience tell us about passing legislation that will similarly put thousands of workers in the energy sector out of work in a short period of time? Do you think the grant program in the bill would sufficiently replace these jobs?

The CHAIRMAN. Thank you very much. Let me thank all the witnesses for their testimony, I appreciate it. I appreciate the panel's comments and statements today.

And I am going to remind the Members that are with us today of the 5-minute rule in terms of questions.

I will now recognize Members for any questions they may wish to ask the witnesses. Let me begin by recognizing Mr. Huffman for any questions or comments he might have.

Sir.

Mr. HUFFMAN. I thank you, Mr. Chairman. Thank you for bringing science back into the forefront of this Committee's business and thank you for your leadership in convening a long-overdue conversation. You have done that with over 22 climate-related hearings under your leadership. We have discussed climate change and what it is doing to water infrastructure, Federal water infrastructure in the arid West. We have talked about how CO_2 emissions are not only heating up the planet, but driving ocean acidification and disrupting coral reefs.

Alongside the work of the Select Committee on the Climate Crisis and other committees of jurisdiction, this House has demonstrated the wide range of threats from climate change, and how we will need a robust response to meet this crisis head on. And, of course, this Committee has some of the most important jurisdiction.

It is important, in my view, that any bill, no matter how well-intended, that does not respond to this crisis needs to be recognized as part of the problem. We should plant trees. We should perfect cross laminated timber. I am ready to work with colleagues across the aisle on those things right now. But we should not call these climate solutions if we are using these strategies to continue deforestation and continue developing and burning fossil fuel at a completely unacceptable and unsustainable pace.

And we also have to respond to the current Administration's binge drilling proposal for public lands and water. Any bill that does not address that is not up to the challenge of this crisis.

Any bill that does not put a stop to the massive increase in drilling on public lands and waters by permanently protecting places like the Arctic Refuge and our coasts will not be enough.

Any bill that ducks the issue of drawing down fossil fuel production on public lands is not enough, because the IPCC is clear: there is already too much carbon dioxide in the atmosphere. We are continuing to admit way too much more. We have to dramatically lower emissions, including from fossil fuels. And even then, even under optimistic scenarios, we are still going to be left with too much CO_2 in the atmosphere.

So, it is only when we get to net zero that some of these wonderful drawdown strategies like Mr. Westerman's tree planting and natural systems can then begin to provide that last full measure of solving the climate crisis.

If we want to talk about trees, let's focus on what will work. And Dr. Staver, in your testimony you note that avoiding deforestation is just as important, if not more so, than reforestation. And, of course, we are running out of time to address this climate crisis. Successful regeneration takes decades to centuries to recover carbon storage potential, especially if we are talking about temporal and boreal forests.

My friends across the aisle want to plant some trees, which is great, but they also want to roll back protections that will allow clearcutting in places like the Tongass. So, I want to ask you, would you agree that Tongass National Forest in Alaska, 16 million acres of temperate rainforest, is exactly the kind of forest we should be protecting right now for its climate mitigation potential?

Dr. STAVER. Absolutely, I agree with that statement. The Tongass is a temperate rainforest, and temperate rainforests are characterized by—there are a lot of trees in them. But I would encourage anybody to go look at pictures of these systems. These are systems with astronomical amounts of soil carbon. So, if you were, for instance, to open up that system to logging, you would remove a lot of the trees, you would make wood products out of them, which you would wind up losing a lot of the other stored carbon in that system, as well.

And then the other issue with deforestation gets to the issue of timescales. Right? If we were to deforest these systems, we start emitting more carbon now, and we don't benefit from the sequestration of carbon now. And any reforestation is only likely to accrue benefits in decades, well past a time frame where it makes any particular difference. So, preventing deforestation in systems like the Tongass should absolutely be a priority.

Mr. HUFFMAN. Thank you. The Forest Service is in the middle of a wholly unnecessary, politically motivated repeal of the roadless rule in Alaska. So, what do you think is going to do more for addressing climate change and ensuring real carbon storage in trees—we are talking about trees, here—stopping the repeal of the roadless rule, or the Trillion Trees Act?

Dr. STAVER. I think we would have to sit down with some numbers and look at actual carbon stocks, but in general, again, I would just reiterate the same thing, which is that preventing destruction of ecosystems that remain intact should be our first priority.

Mr. HUFFMAN. And if we are serious about a climate crisis, of course, we should do both, probably. Right?

Dr. STAVER. Probably, yes.

Mr. HUFFMAN. OK. Thank you very much. I yield back.

The CHAIRMAN. Mr. Gohmert.

Mr. GOHMERT. Thank you, Mr. Chairman. I appreciate the witnesses all being here today.

Dr. Staver, you had mentioned the 1° Celsius increase being unprecedented. What are the years for that increase?

Dr. STAVER. So, we are talking about global averages, rather than global extremes. Global average temperatures have increased by about 1° Celsius since pre-industrial levels. Pre-industrial levels are counted either since 1750 or since about 1860, depending on the count. But regardless of the count, global average temperatures have increased in the last 150 years by about a degree Celsius.

Mr. GOHMERT. Yes, and how does that compare to 1,000 years ago, when the Norse were, as we know now, they were planting corn in Greenland. Can you make an analysis of how we are doing compared to 1,000 years ago, when they had these farms that were producing in southern Greenland?

Dr. STAVER. The useful point of comparison, really, is something in the more recent past. You will all be familiar with the hockey stick curve, which either you could think of CO_2 concentrations atmospherically, or temperatures atmospherically. But there was a long period of constant temperatures, followed by——

Mr. GOHMERT. Are you defending the hockey stick curve?

Dr. STAVER. Sorry?

Mr. GOHMERT. Are you defending that still?

Dr. STAVER. Oh, sure, absolutely.

Mr. GOHMERT. OK. Well, then, let me move on to Mr. Hollie.

Mr. Hollie, you bring up such a good point, and it is one that was made by a constituent of mine. This was during the Obama administration, and her energy prices were getting quite high, and she said, "You know, I was born and raised in a home, and the only source of any energy was a wood-burning stove. And things have gotten so good, but now the price of energy getting so high, I am afraid I am going to die in a home that only has a wood-burning stove."

And I said, "Well, I have bad news for you, there is an effort to eliminate your wood-burning stove now. You won't even have that."

But it seems very clear that there is a dramatic effect on people's physical and mental health that live in poverty, and that seems to be the point you are wanting to make sure doesn't get lost in all this. And when we increase the price of energy, it is inconvenient to the Nation's wealthy, but it is absolutely devastating to the poor.

Mr. HOLLIE. Yes, sir.

Mr. GOHMERT. It sounds like you spent a great deal of time looking at that particular issue, correct?

Mr. HOLLIE. Yes, sir. That is one of the main issues that our organization addresses is energy poverty. And as I stated in my testimony, I have talked to thousands of African-Americans in several states. We do these events. And we have actually asked people to bring out their energy bill, and we talk to them about energy, and energy poverty, and what it is, and they all express, "Why am I paying this on my bill? Why do I have to pay this if I am not benefiting from it?"

And some of these communities will never ever see the benefits or reap the benefits from going green. And I use the example of my 84-year-old mother-in-law, right here in the District of Columbia, who is struggling right now each month on a fixed income, and has to deal with the rising cost of energy, along with her healthcare expenses.

Mr. GOHMERT. And I really do appreciate your efforts. In fact, John Dingell was removed as Chairman of Energy and Commerce after he made the comment—and I know Speaker Pelosi back at the time wanted a carbon tax bill passed, and it was called cap and trade. But he made the comment—you can find it online—that the cap and trade bill is not only a tax, it is a great, big tax. And, as he made clear, it really hammers the people that can least afford it.

So, concerned about people's health, No. 1, it would seem we would need to take a balance into consideration here to make sure we don't devastate the poor, where they can't even afford to live any kind of decent life because of the cost of energy.

But we have a lot of pine trees in east Texas, where I am. And in the last decade or so, harvesting this renewable resource, we don't have any sequoias, redwoods, they are pine trees, they grow back in 20, 25 years. And it seems very clear that the oldest pine trees, they don't do a good job of sequestering carbon. So, I am hopeful that people will wake up to the fact that it is good to manage what we have, including renewable trees, to make them even better at sequestering carbon.

But I appreciate your time. It is one of the things I hate about the 5-minute rule. But you have lived by it, and now I do. Thank you.

Mr. HOLLIE. Thank you, sir.

The CHAIRMAN. Mr. Levin.

Mr. LEVIN. Thank you, Chair Grijalva, for convening today's hearing. My district in coastal Southern California is already feeling the impacts of climate change, and I think it is critical that Congress explore every option for addressing this crisis, and this hearing is an important step in that effort. And I look forward to working with my colleagues on both sides of the aisle on solutions that are commensurate with the challenges that we face.

As has been discussed today already, public lands and waters contribute about a quarter of greenhouse gas emissions from our country, and we have an urgent need to reduce these emissions in order to protect public health and safety. That not only means maximizing carbon sequestration options like reforestation, but also drastically curbing fossil fuel extraction on public lands. I appreciate Chair Grijalva's efforts to make a real impact and ratchet down emissions associated with programs under this Committee's jurisdiction.

Governor Ritter, I wanted to start with you. Utilities and power providers across the West have made major emission reduction commitments, including Xcel Energy's commitment to deliver 100 percent carbon-free power by 2050. But why are utilities doing this?

And can increasing the number of responsibly sited renewable energy projects on public lands help these utilities achieve their goals?

Mr. RITTER. Well, the answer to your second question, sir, is yes. This public lands carbon reduction is absolutely a part of what other states and cities, including utilities, are doing.

Xcel, their 100 percent commitment is a pretty interesting one—it is 2050. The more interesting commitment, in my mind, may be their 2030 commitment, which is an 80 percent reduction. And what they will tell you today, 10 years out, is that they know how to get there. They don't know how to get to 100 percent. And most utilities that have made a 2050 commitment to 100 percent don't know how to get there, but they can get to 80 percent because of things that they have already been able to do.

The really interesting thing—and this ties back to this conversation about price, and price of renewables is—it feels sort of disconnected with reality in many places around this country. Xcel Energy is going to go to 55 percent renewables by 2025, not because anybody is telling them they have to, it is what the market is dictating for them.

Their prices right now, according to sort of the average, levelized cost of energy in America, they are 35 percent below the rest of the country, and they have gotten better over time by increasing wind and solar on their grid.

This isn't just a Colorado phenomenon—the Southwest Power Pool in 15 states, there are days where they are putting 75 percent of all the energy that they provide, they are providing it through wind energy in that wind river in the Midwest. So, that is carbon free, but it is also 1.5 to 2.5 cent wind that we are looking at.

So, we have to do a good job of always paying attention to equity concerns here, and income equity concerns. It is one of the things that we always use, a lens to screen clean energy policy through. But, in fact, because of the dramatic decreases in solar storage and wind, we have a lot of carbon-free sources that beat out a variety of different kinds of fossil fuel sources.

Mr. LEVIN. Thank you, Governor. I appreciate that. And I have to brag on California for a second, being from California. The California Independent System Operator has a great app, the CalISO app. As of right now, 40 percent of renewables are serving our demand, including over 7,600 megawatts of solar. So, it can be done, and it is the future. And I am grateful for your leadership in Colorado.

Mr. Walsh, I wanted to turn to you. H.R. 5435 incentivizes clean energy production and jobs on our public lands and waters. I also have a bill, the Public Land Renewable Energy Development Act. It is a bipartisan bill with Mr. Gosar, which would facilitate renewable energy generation on Federal lands.

How can we ensure that the jobs created by today's bill, and the growth of the renewable energy industry in that bill and in other efforts, are good jobs that benefit American workers?

Mr. WALSH. Thank you for the question, Mr. Levin. There are a number of very established ways in which we can make sure that those are good jobs. We can use labor standards like prevailing wage, we can use mechanisms that take advantage of the best skill

training out there in the construction trades, which are registered apprenticeship programs. We can ensure that products we use, and the materials we use that go into those projects are American-made by U.S. manufacturers.

The mechanisms are there. We have to apply them to the task.

I do want to note, as well, that, in addition to our Federal lands, our Federal waters are also an enormous source of both clean energy production and job creation. The estimated numbers are actually rather stunning. The National Renewable Energy Laboratory has estimated the job creation potential off the Atlantic Coast alone at up to 212,000 jobs per year in the United States, and that is just looking at the installation of 54 gigawatts of wind out of a total wind energy potential of over 1,200 gigawatts.

The only grid connected offshore wind project in the country so far—which is going to change very, very quickly—is Block Island, off of Rhode Island. That was just five turbines, but it supported 300 jobs across the building trades, and it was all done under a project labor agreement.

Mr. LEVIN. I think we are over time. Thank you, Mr. Chairman. I yield back.

Mr. MCCLINTOCK. Mr. Hollie, let me just dovetail onto that point.

It is true, California does have a major commitment to wind and solar power. We also bear one of the heaviest electricity costs in the entire country. This in a state that used to have the cheapest electricity.

What is better, cheap electricity or expensive electricity?

Mr. HOLLIE. I would have to say cheap electricity, sir.

Mr. MCCLINTOCK. What is better, scarcity or abundance?

Mr. HOLLIE. Abundance, sir.

Mr. MCCLINTOCK. Now, those seem to be rather self-evident questions, but they seem to be completely lost on many of my colleagues.

Ms. Gleich, you did mention the disappearing snows. I represent the Sierra Nevada. That is, obviously, a big concern for my district. And I recently read an observation that I wanted to share with you along the lines you just pointed out.

Snows are less frequent and less deep. They do not often lie below the mountains more than 1, 2, or 3 days, and very rarely a week. They are remembered to have been, formerly, frequent, deep, and of long continuance. The elderly inform me that the earth used to be covered with snow about 3 months in every year. The rivers, which then seldom failed to freeze over in the course of the winter, scarcely ever do now. Are these the concerns that you are expressing?

Ms. GLEICH. I can speak to my experience as a professional ski mountaineer and snow sports athlete. We are definitely, a great way that I have heard it described——

Mr. MCCLINTOCK. Well, I don't need—just are we talking about the same thing, the disappearing snow, the less frequent snowfall, the melting snow earlier in the year?

Ms. GLEICH. Yes, and we are seeing more snow fall as rain.

Mr. MCCLINTOCK. Would it surprise you to learn that that observation was made by Thomas Jefferson? You will find it in his notes on the state of Virginia in 1799. What he was describing is the

beginning of the era that we are still in. It is called the Modern Warm Period. It followed what was called the Little Ice Age.

During the Little Ice Age, the Thames River, for example, would often freeze over. In fact, for many years, it froze over solid every winter. We had advancing glaciers across Northern Europe. In fact, they used to hunt people for witchcraft for, obviously, causing these glaciers to advance. So, that hasn't changed very much, I think, and I hope that will be of some reassurance to you.

Mr. Marshall, it is not clear to me where we are going to fit more trees on the Federal lands. Again, our forests in the Sierra have roughly four times the tree density that the land can currently support. It is choking off our forests. We have lost record numbers of trees to over-crowding that stresses them, makes them susceptible to disease, pestilence, and, ultimately, catastrophic wildfire.

We have had testimony before our committees that this over-concentration of trees that is killing the forest has actually made the forests a net emitter of carbon dioxide, as that carbon is released either through fire or through the rotting of the dead timber.

The rest of the Federal lands that aren't forested are mainly desert, can't support trees, particularly when you consider that a single pine tree in the middle of a hot summer's day is going to transpire about 100 gallons of water in a day.

So, where do these extra trees go?

Mr. MARSHALL. Around 90 percent of wood products in this country come off of private lands. The Federal forests are critically important——

Mr. MCCLINTOCK. But we are talking about planting more trees in the Federal forests that are already densely over-crowded, and dying because of it.

Mr. MARSHALL. And at the same time, if you are harvesting and then replanting, it is a dynamic cycle.

Part of the motivation that we first got into cross laminated timber with was specifically looking at that over-stocking issue. But at the same time, if you look historically in this country at the role of reforestation, what we have done, it is an incredible track record.

Mr. MCCLINTOCK. Granted, we are talking about Federal lands that are suffering from gross benign neglect, really. We have stopped managing them.

In pre-Columbian times, we would lose between 8 and 12 million acres a year to catastrophic fire in California. Good management brought that figure down to about a quarter-million acres a year. We stopped that, starting in the 1970s, and we are back up to 2 million acres of losses.

Mr. MARSHALL. Yes.

Mr. MCCLINTOCK. Ms. Staver, in just the brief time we have left, you mentioned that 400 parts per million is catastrophic. What would you see as the ideal CO_2 concentration for the atmosphere?

Dr. STAVER. I am not quite sure how to answer that question, to be honest with you.

Mr. MCCLINTOCK. You are saying 400 is too much, so what is the ideal CO_2 level for the atmosphere?

Dr. STAVER. I can tell you that pre-industrial CO_2 concentrations were about 280. Congressman Westerman cited a more precise number, which is 283 parts per million.

Mr. MCCLINTOCK. That is correct.

Dr. STAVER. We are currently over 400 parts per million, so we are 415——

Mr. MCCLINTOCK. And, by the way, it went up to about 315 million by mid-20th century. Not a lot of that because of man-made CO_2 emissions.

But when you look at the entire geologic history of the planet, it is estimated that our CO_2 levels were averaged about 2,600 parts per million. In fact, if you are going to build a hydroponic atmosphere, you want about 1,200 to 1,400 parts per million for ideal plant growth.

Dr. STAVER. Congressman, the Earth is a dynamic system, but that doesn't change the fact that humans are changing the Earth's system, and we are changing the climate.

Mr. NEGUSE. Thank you, Mr. Chairman, and thank you to each of our witnesses for being here today. In particular, I want to thank our governor, the former governor of Colorado, a good friend of mine, and a constituent, a mentor, Bill Ritter, who has led our state for many years, and we appreciate his leadership and the work he is doing now.

I want to just reiterate how important this conversation is that we are having today. Climate change is the existential threat of our lifetimes, and it is a complex problem that can only be solved by an aggressive transformation of our energy economy.

I do believe that the solutions can be bipartisan. For instance, my colleague, Representative Curtis from Utah, and I have a bill to mandate a national study on carbon sequestration in Federal soils. And I have no doubt that my colleagues have the best of intentions when it comes to addressing carbon sequestration. And while I do have some concerns with respect to Mr. Westerman's bill, I want to say thank you. I appreciate his efforts in this regard, and certainly look forward to working with him on bills in the future.

I want to focus my first round of questions to you, Governor Ritter. You mentioned this both in your verbal testimony and also in your written testimony. According to the IPCC, we must reach net zero emissions by 2050, in order to avoid the most catastrophic impacts of climate change. But that also means that we cannot afford to abandon the communities that will be most impacted by this transition. And that certainly is the case for some communities in my state of Colorado.

As coal plants continue to retire across the country, coal-mining states, obviously, will be impacted. And, as you noted in your testimony, two coal-reliant towns in Colorado, Craig and Hayden, are in the middle of that transition.

How would you recommend the Federal Government support communities and workers impacted by the necessary move away from fossil fuels? And what lessons can we learn from those towns that you have worked with directly?

Mr. RITTER. Thank you, Mr. Neguse. In one of the places in my written testimony, I talk about how important it is, first of all, to

understand the community. Because all these communities are going to actually be different. And there is probably not a one-size-fits-all solution.

If you think about Gillette, Wyoming; Craig, Colorado; Page, Arizona, where the Navajo Generating Station is now closed down—and, Mr. Chairman, I know you know a lot about that—there are 700 tribal members who were put out of work by that closure. The Hopi Indians lost 80 percent of their revenue when the coal mine closed. It was owned by Peabody, so there are going to be different things.

SRP, which is the Salt River Project, created by Federal legislation, is actually doing a lot of work on the just transition with respect to putting people back to work in a variety of different ways. So, it is going to depend upon the location.

The work we are doing—transition work, we call it—in Craig and Hayden, and Tri-State, which announced that it is going to close all of its coal by 2030, and Colorado is actually going to build out solar, and will do different kinds of workforce training, but there are going to be different Federal assistance plans that could help. Some of that may be on health benefits, some of it may come with pensions. There are coal companies that have actually declared bankruptcy and been relieved of their pension liability by a Federal bankruptcy judge. So, pensions could be a part of that, and it could be workforce training. It is just going to depend upon the community.

But what I like about this bill is it is Federal legislation that says the Federal Government has a role and a responsibility in looking at coal-dependent communities, and understanding, with this transition, there are things that will be necessary for there to be a vital community still.

Mr. NEGUSE. Thank you, Governor.

The last point I would like to make, I remain concerned about the willingness of so many to try to mask the problem, right? And the threat of climate change, and the real impact it is going to have on communities across our country, and already is having—in particular, disadvantaged communities and minority communities.

So, Mr. Hollie, I reviewed your written testimony. On the last page, you said, "according to a *New York Times* article published on June 19, 2019, our air quality in America is the best it's been in decades." Are you aware of the title of that article?

Mr. HOLLIE. Yes, the title——

Mr. NEGUSE. The title of the article is, "America's Skies Have Gotten Clearer, but Millions Still Breathe Unhealthy Air." Is that right?

Mr. HOLLIE. Yes.

Mr. NEGUSE. And you are aware that, in that same article, the authors note that more than 110 million Americans still live in counties with unhealthy levels of pollution, according to the EPA?

Mr. HOLLIE. That article did state that, yes, sir.

Mr. NEGUSE. And you were aware that the article also says that an estimated 100,000 Americans die prematurely each year of illnesses caused or exacerbated by polluted air?

Mr. HOLLIE. That is correct.

Mr. NEGUSE. All right. Well, I would like to submit that article for the record, with unanimous consent, because it is important for us to understand the context of that article that you quoted.

The CHAIRMAN. So ordered.

Mr. NEGUSE. This remains, as I said at the beginning of my remarks, an existential threat that we all should collectively be working to combat against.

With that, I yield back.

Mr. HOLLIE. If I may, sir, it still does not dispute the fact——

The CHAIRMAN. The gentleman yields.

Mr. HOLLIE. I am sorry.

The CHAIRMAN. I turn to Mr. Gosar.

Dr. GOSAR. Mr. Hollie, would you like to finish your statement?

Mr. HOLLIE. Yes, sir. I was just going to add that the article does state, regardless of all the things that you said—and I agree with you wholeheartedly—that our air quality is the cleanest it has been in decades, and that is due to the Clean Air Act of 1970 and the fact that we have transitioned to natural gas, which is cleaner, and it just burns better, and it is affordable, it is reliable. And that is the reason why our air quality is much better right now.

Dr. GOSAR. Thank you, Mr. Hollie. As you stated in your testimony, you highlighted the reduction of the CO_2 emissions, due to America's shift to natural gas. And you also cited a *New York Times* article finding that air quality in the United States is the best it has been in decades.

I would like to add that the energy-related CO_2 emissions decreased 2.9 percent in 2019, despite our booming economy. We also had the largest decrease in emissions of any country. This high level of production has been achieved on the smallest number of acres in four decades. In Fiscal Year 2018, revenues from oil and gas production on Federal lands totaled $1.1 billion. But the number of leased acres has decreased every year since 2009.

The fact is, energy demand will not go down if we stop leasing on Federal lands. Instituting a ban on oil, gas, and coal will simply allow Saudi Arabian oil, Russian LNG to rush in to fill the void. And my colleagues on the other side of the aisle have a vision of renewable energy coming to the rescue. But, ironically, their own policies will keep that from happening.

The massive scale of renewables that would be needed under this bill would be hopelessly entangled in expensive, punitive Federal regulations, and any attempts to streamline the years-long review process has been stymied at every turn. I am taking my PLREDA bill. How long has it toiled? We are not seeing a change.

For example, witnesses spoke today of expanding that offshore. But this would be sidelined by the severe lack of transmission capability, and made even more difficult by the expansion of the Migratory Bird Treaty Act under a bill sponsored by my colleague, Representative Lowenthal. This Committee is so committed to keeping regulatory hurdles in place, they won't even move a bill to allow for easier exploration of geothermal resources sponsored by Representative Fulcher.

How could our country possibly support itself with renewable energy within 20 years, when we can't even get a categorical exclusion for geothermal testing through this Committee?

Even members of the Democratic Party have voiced their opposition to bans on fossil fuel production. Representative Conor Lamb from Pennsylvania said, "To think about enacting a bill that would directly eliminate people's jobs, like what we are using to feed their families, save for their kids to go to school is just wrong. And the Democratic Party has never stood for that kind of thing. We have always stood for protecting people's jobs, and I think we have a job of getting that back." That is clearly a different position than the proposal we are hearing and discussing today.

Once again, Representative Torres Small, whose region in New Mexico is experiencing a boom in oil production, has said, "If we shut down oil and gas drilling in New Mexico today, we will have to shut down our schools tomorrow." And she will continue to support responsible production on those lands.

Finally, I would like to mention one major issue that remains unaddressed. Assuming that renewable projects can get through our regulatory maze, the United States simply doesn't have enough resources to build them. We are reliant on other nations for our critical minerals, including copper, lithium, cobalt, gallium, and dozens of others. And you cannot construct electric vehicles, wind turbines, or solar panels without them. Policies from my colleagues across the aisle to prevent domestic mining and, at the same time, ban production of oil and gas and coal, are completely at odds with each other.

Governor, you bring up the renewables, and so does California. Well, once again, it is intermittent. It is not baseload power. And we have a big problem here—the battery storage. And we have to be investing in it.

So, Mr. Walsh, I am going to turn to you. We recently heard from Jason George of the Operating Engineers Union, supporting domestic mineral development. In your testimony, you stress the importance of requirements for fair and safe working conditions throughout the global supply chains. As you know, almost two-thirds of the world's cobalt comes from the Congo, and other minerals used in renewables are sourced from countries across South Africa, South America, and China. Almost all these materials go through China at some point in their supply chain.

Given what we know about the environmental and labor standards in the United States compared to other parts of the world, do you support the responsible sourcing of critical minerals for renewable development here at home? And would you join Mr. George in supporting domestic mineral development, Mr. Walsh?

Mr. WALSH. Thank you for the very good question, Mr. Gosar. I think this is a really important subject. Your question speaks to the reality that, as we make this transition, we are going to actually increase demand for certain minerals. You mentioned a couple of them, including cobalt. But, of course, copper and nickel are also going to see increased demand. We are supportive of responsible mining.

Dr. GOSAR. Yes, so let me ask you that, just to intervene. Do we do it better than anybody else in the world?

Mr. WALSH. I think we have models in this country for how we can do mining in ways——

Dr. GOSAR. Actually, the truth is nobody meets our environmental standards, so we do it better than anybody else in the world, and we should be doing it here. We have that, and we have it at our fingertips.

I yield back.

The CHAIRMAN. Mr. García, you are recognized, sir.

Mr. GARCÍA. Thank you, Chairman Grijalva, Ranking Member Bishop, and, of course, to the panel of witnesses today.

We speak on one of the most important issues that we are currently facing, and one that will impact generations to come, including my grandchildren.

Chicago has uneven and inequitable exposure to pollution and toxins across its neighborhoods. My neighborhood, on the southwest side, where, historically, much of industry was located, in Little Village, ranks on the 98th percentile in the United States for air pollution that causes cancer and other respiratory hazards. It is no surprise that kids in my community are hospitalized for asthma at three times the rate of other parts in the city of Chicago.

Chicago's environmental problems are closely tied to the persistent health, economic, and racial inequities that have developed over decades.

Job opportunities, Mr. Walsh, in your testimony, you share that tackling the crisis of climate change, if done right, can serve as a significant opportunity to create good-paying jobs, middle-class jobs across the country. Can you share with us how policy solutions to address climate change would benefit working families and economic development in cities like Chicago?

And second, how do we ensure that these good jobs reach our communities in an equitable manner?

Mr. WALSH. Thank you. I noted earlier we have a number of policy mechanisms that can ensure that, as we build this clean energy economy, we do it in an equitable, inclusive way.

I mentioned project labor agreements. There are a variety of project labor agreements, sometimes called a community workforce agreement, that actually includes local hiring, and the development of career pipelines that ensure that, as projects get built, whether they are clean energy projects or any other kind of project, that the people who actually live in that community are getting the work, and not just the jobs, but are moved into careers with the unionized building trades.

To my mind, that is one of the best examples that we see out there.

Mr. GARCÍA. I thank you. On the topic of cost to low-income households, as we find solutions to climate change, we are often told by those who oppose efforts to curb greenhouse gas emissions that it will inevitably result in higher energy prices for consumers, especially for low-income households. It is an argument that I don't really buy.

Mr. Hollie, can you briefly walk us through the impacts of policies aimed at addressing climate change, and for low-income households, how costly, if at all, are such policies for working-class communities?

And, finally, what are the costs of inaction on the climate?

Mr. HOLLIE. Yes, if I could address the first part of your question, because, like I said, I deal with a lot of people, African-Americans, minorities, when it comes to energy poverty. And they all talk about the rising cost. And as we all know in this room, energy is a fixed cost. So, when your energy goes up, everything else around you goes up, and people feel that immediate impact.

And you speak about Chicago, I did a radio interview in Chicago on a Chicago radio station just a couple of months ago. And the interesting thing about it there in Chicago, it was health care, and how immigrants are being put before the African-Americans who actually were born and raised in Chicago.

And housing is a particular issue. We talk about climate change and that kind of thing, and what it is doing to the atmosphere and to the people and pollutants, but we don't talk about the in-home pollutants that come with housing.

And just getting back to answer your question about the energy poverty piece—like I said, we have done events where we have had people bring in their electric bill. And they point out, "Why am I having to pay for this? Why am I having to pay for this?" And this is a cost that they have to absorb that is unnecessary.

And if I could, what was your second question?

Mr. GARCÍA. The last question is what are the costs of inaction on climate?

Mr. HOLLIE. The cost of inaction would be—I have to say, if we don't do something—we have to address climate change. But we have to do it sensibly. And I think these regulations, and some of the things that we are proposing right now, are going to do more harm to these individuals in these communities than it will do good right now.

Mr. GARCÍA. Thank you. As we continue to look for solutions to the challenges posed by climate change, we must ensure that low-income communities like the ones I represent in Chicago can be a part of efforts to address this existential crisis. This means including them in a new green economy. We are talking about creating good-paying union jobs in the renewable energy sector.

I thank the witnesses and the Chairman for this hearing. I yield back.

The CHAIRMAN. The gentleman yields.

Mr. WESTERMAN. Thank you, Mr. Chairman, and thank you again to the witnesses.

Dr. Staver, I read your testimony several times, made a lot of notes. And I want you to know there are a lot of things in there that we agree on, and there are a lot of issues that I think maybe you don't understand exactly what is in the bill text. But that is fine, that is why we have these hearings.

You attacked the Swiss research report, and that is fair, that is what academics do. That is what you are supposed to do. You say their estimates of carbon sequestered in 1 trillion trees is only 42 gigatons. They say 205 gigatons. In the words of Billy Joel, you may be wrong, for all I know, you may be right. But I don't think you are crazy, and I don't think the other researchers are crazy. I think there is more work that needs to be done in that area.

There has been talk about deforestation, which I totally agree, stopping deforestation, making our existing forests healthy is one

of the most proactive things that we can do, and using forests to mitigate carbon. And there is a whole title in my bill about doing just that.

So, to you, what does sustainable forestry mean?

Dr. STAVER. Thanks very much, Congressman Westerman. And can I take a moment to say I also think we probably would agree on a lot of things?

And the flavor of my testimony would have been very different if we had, in addition to talking about trees and forests as a solution to climate change, if we were also talking about fossil fuels.

Mr. WESTERMAN. But this bill is focused on one issue. There are other bills to focus on those other things. Sustainability is keeping something at a level or better than you found it in the past to get on to future generations. And that is what this bill is all about, sustainability. Is it possible to harvest timber in sustainable forestry?

Dr. STAVER. Sure, cosmically, it is absolutely possible. I think, though, the flavor of that, and sort of what sustainable forestry actually looks like depends a lot on the system that you are talking about.

Mr. WESTERMAN. Exactly, and there are experts that understand all of that, and can figure out what sustainable forestry is. We have certification systems that look at forests and say, "This has been managed sustainably."

And there is a difference between sustainable harvest and deforestation. Where does most deforestation in the United States take place? Is it on Federal lands or private lands?

Dr. STAVER. It has to be private lands, right?

Mr. WESTERMAN. It is absolutely on private lands. On working forests, where those products that make mass timber and other products come from.

What is the No. 1 reason for deforestation in the United States?

Dr. STAVER. That is a great question.

Mr. WESTERMAN. It is development. It is fragmentation and development, where private landowners look at their property and they say, "There is no economic benefit for me having this property," so they sell it to developers, or they split it up and sell it off in small pieces, and they lose the forest management part of it.

Markets are critical in keeping working forests working. Mr. Marshall, with your experience at the Forest Service—and you talked about the research that was done there—why did the Forest Service say that we need to come up with more markets? What was the driving force behind coming up with more markets?

Mr. MARSHALL. There are a number of reasons. And part of it is just the agency's perspective on sustainable forest management involves active management. And you cannot do active forest management at any scale without forest products. So, forest products are perceived as key to the sustainability of the Nation's forests.

Mr. WESTERMAN. And I know we call it planting a trillion trees, but, for the record, most trees regenerate naturally.

Mr. MARSHALL. Yes.

Mr. WESTERMAN. And on Federal lands, with just a little bit of help, and clearing out underbrush, and making the forest resilient,

you will get massive regeneration, much more than we could ever plant on Federal lands when they are naturally regenerated.

There is probably no reason to plant trees on Federal lands, except where there has been catastrophic wildfire and you are trying to restore them. Would you agree with that?

Mr. MARSHALL. I think there are more conditions than just that, but that would certainly be the primary one.

Mr. WESTERMAN. All right.

Dr. Staver, you say there is too much risk with forestry, it takes too long. But isn't it worth the time, and is there a better time to start than now?

Dr. STAVER. So, what I was saying, the argument that I was making when I said it takes too long is—and, actually, Congressman Gohmert references, I think, when he mentioned that pine trees in Texas take 20 to 25 years to grow, right? If you cut a bunch of trees, even if you manage to sequester all of that carbon without additional carbon cost to transportation and production, you are going to lose a bunch of soil carbon in that project, as well.

And the sequestration benefits that you get from those trees will accrue over timescales of 20 to 25 years, which is too late to be achieving climate mitigation goals on timescales that really matter for us now. This is an emergency that we need to find solutions to now, not 20 to 25 years from now.

Mr. WESTERMAN. Is there a better solution for pulling carbon out of the atmosphere than trees?

Dr. STAVER. There are better solutions to keeping carbon out of the atmosphere.

Mr. WESTERMAN. I didn't say keeping it out, I said removing it.

Dr. STAVER. I do know that that is not what you said. And I think the point has also been made today during this hearing that, were we in a situation where we had no—I mean, purely hypothetically—if we were in a situation where we had no fossil fuels, trees are a great solution for sucking carbon out of the air, and I actually think that is one of the points we agree on.

Mr. WESTERMAN. Thank you.

The CHAIRMAN. I am going to continue. Mr. Hern, you are recognized, sir.

Mr. HERN. Thank you, Mr. Chairman and Republican Leader Bishop and the witnesses, for being here today on such an important topic.

First, I would like to discuss the Chairman's bill, H.R. 5435, a continuation of my colleagues' war on fossil fuels. I am sure you would like to talk about fossil fuels. This bill is a misguided attempt by my colleagues across the aisle to pander to the folks in their base through destroying our domestic energy production, and they are going to claim that we need to attempt to limit CO_2 emissions. But if they really care about lowering CO_2 emissions, they would be praising the fact that the United States is a global leader in emissions reductions, thanks to industry-led innovation.

According to the International Energy Agency and the Joint Research Center from the European Union and others, after dropping almost 3 percent in 2019, energy-related carbon dioxide emissions are estimated to drop by 2 percent again this year, and 1.5 percent in 2021. This means that in 2021, emissions will be at

their lowest since 1991, even though we will have a much larger population and more production than we did 30 years ago.

And this is not a new trend. Some of this has been talked about today. But from 2005 to 2017, we cut our CO_2 emissions by 14 percent, a number greater than the next 15 countries, combined. However, even as we cut our domestic emissions, global emissions continue to grow throughout this time frame, as they increase 6.8 billion metric tons. And of this, 5.9 billion metric tons, or 86 percent of that increase, came from China and India.

This proves that curbing our ability to produce energy in the United States will not solve the problem of global emissions. It will only add to our problems, while crushing our American energy independence and raising our fuel prices for millions of hard-working Americans. And because of this, I couldn't support my fine Chairman's bill.

But, for other bills before us today, it is a more pragmatic approach to our climate issues. We have heard a lot of this debated today from my colleague from Arkansas, who lives in a beautiful part of the state that I grew up in.

However, I want to yield my time to Congressman Westerman. And it is always great to see two Yale people go at each other on a topic that is so important, talking about something that is relatively easy for us to get after, and that is planting a trillion trees. So, Mr. Chairman, I would like to yield to Congressman Westerman.

Mr. WESTERMAN. I thank the gentleman from Oklahoma. And I don't consider it going at one another, we were just having a friendly conversation here. And I wish we had longer to have that conversation.

And let's talk about fossil fuels a minute. Dr. Staver, you talked about the bucket not being large enough, or the bucket is not that large. There is only, I think, a fourth of the bucket left. But others on the panel, because this kind of crosses over with the bills, may want to answer this question.

Where did all fossil fuels originate?

Dr. STAVER. Are you directing that at me or at him?

Mr. WESTERMAN. You can go first, or if somebody else——

Dr. STAVER. So, fossil fuels are generally derived from the biosphere, right? Those are sort of, essentially, plant-derived carbon that has been stored for millions of years in the Earth's crust.

So, actually, that carbon has been in fossil fuels for millions and billions of years, which, I think, would possibly be evidence that there are things that are better at trees than holding on to carbon, which is specifically fossil fuels, right?

So, those fossil fuels have held on to carbon for a very long time.

Mr. WESTERMAN. But they all started with plants.

Dr. STAVER. Oh, sure.

Mr. WESTERMAN. And photosynthesis.

Dr. STAVER. Sure, you have to——

Mr. WESTERMAN. So, all of that carbon that is in fossil fuels now was at one point in the atmosphere above the Earth.

Dr. STAVER. Oh, indisputably.

Mr. WESTERMAN. Indisputably?

Dr. STAVER. Correct.

Mr. WESTERMAN. OK, so the bucket is actually quite large.

Dr. STAVER. That is a different bucket.

Mr. WESTERMAN. Can we store, does wood store carbon?

Dr. STAVER. Yes, sure, wood holds carbon.

Mr. WESTERMAN. So, if we put wooden buildings like the mass timber—if we use wood products, are we not creating a reservoir of carbon above ground?

Dr. STAVER. Yes, and the key issue there is residence times, right? So, if you are storing wood in buildings, it stays there forever, you are locking up carbon that stays there forever. But the question is how long does the carbon stay there.

Mr. WESTERMAN. Did you know the oldest structures on Earth are wooden structures. And when we use wood, does it require less energy producing that wood, and transporting it, than other building products?

Dr. STAVER. I expect Mr. Marshall is more qualified to answer that question than I am.

Mr. WESTERMAN. Mr. Marshall, would you——

Mr. MARSHALL. I will give you a yes on that.

Mr. WESTERMAN. All right, so when you calculated 42 gigatons, did you include in that any carbon stored in wooden structures?

Dr. STAVER. I think the key thing, and I think one of the points that we agree on, is that there absolutely is a place for sustainable forestry and for tree planting to contribute to mitigating emissions. I agree with that point. I think the key thing is to avoid deforesting existing forests to do that.

Mr. WESTERMAN. I am all with you on that.

Dr. STAVER. Oh, great. Then we agree.

Mr. WESTERMAN. I yield back to the gentleman from Oklahoma.

The CHAIRMAN. The gentleman yields?

Mr. HERN. I yield.

The CHAIRMAN. Thank you.

Mr. Lowenthal, you are recognized, sir.

Dr. LOWENTHAL. Thank you, Mr. Chair. It is nice to see the Ranking Member smile. I like that, Mr. Ranking Member.

Governor Ritter, why is it essential, the question, for businesses, utilities, and governments, both state and Federal, to have emission reduction targets?

And do you think the targets that we have laid out here in H.R. 5435 are appropriate targets for U.S. public lands and waters? Are they the targets that you might have put out?

Mr. RITTER. Thank you, sir. I do think they are the appropriate targets. They mirror what states across the country have done in setting their own targets. There are a variety of states that have passed climate legislation, where they are looking at different years, and intermittency, in terms of target reduction. But I think that it does that. It is probably a little bit weaker than some states are, but it is still an important thing for the Federal Government to participate in that.

You asked the question, though, about why companies would do that, and why states would do it. And let's go to companies first.

I said earlier in my testimony, there were 16 major utilities that now have 100 percent goals. And very many of them are

shareholder-owned. They are looking at their business model and at their infrastructure, and seeing threats from climate change as a part of it, and the need to transition.

But there is also a market-driven part of it, too, where they can actually reduce their emissions and, at the same time, reduce their rates because of the downward spiral and the cost of both renewables and natural gas. It is fair to say that natural gas has absolutely played a role in this. But utilities actually see the need to do that in order for them to consider themselves to not be at risk, going forward, over the next 20 to 25 years.

Dr. LOWENTHAL. I am not sure I understand. I am going to kind of follow up on that.

I am from California. We met our 2020 targets that we laid out. We are not going to meet our 2030 targets, not so much because of the utilities and the power sector, but because of transportation issues.

How are we going to deal with setting targets, and do you see us now ramping up transportation? Because that is going to be, for us in California, the critical issue, is how do we meet some of the industry targets.

Mr. RITTER. So, sir, you are correct. Transportation emissions in this country eclipsed power generation emissions a couple years ago, the first time since the 1970s that that was——

Dr. LOWENTHAL. And they have gone up in California.

Mr. RITTER. And they are going up everywhere. People who study climate, and study climate policy, like I do, would say the most important piece of climate policy in America may be the waiver that California has.

There are now 10 states that follow California with a zero-emission vehicle target, and 25 states that have a low-emitting vehicle target. Some of those states—there are a total of 25, right, and 10 of them also have a zero-emitting vehicle target. And they are relying upon the mandate from California under the Clean Air Act in order to do that. And we have to get a handle on transportation emissions. These reductions in emissions that have been talked about today, where the United States is having a downward curve, have everything to do with power generation and the power sector and the transition out of coal to natural gas and renewables——

Dr. LOWENTHAL. Right, and that has been wonderful. Yes.

Mr. Walsh, I want to get back to—by establishing net emission targets, H.R. 5435 incentivizes the growth of renewable energy, including offshore wind. Currently, there are no wind turbines in Federal waters. But leases have been issued that hold the potential to generate enough electricity to power 5.5 million homes. Can you discuss the types of potential offshore wind industry jobs that H.R. 5435 will help create?

Mr. WALSH. Thank you for the question, Mr. Lowenthal. Yes, they are numerous. I mentioned building trade occupations in an earlier response, and that ranges from electricians to cement masons, you go on down the list. But I think it is also important to realize that there are operations and maintenance jobs associated with that build-out.

And then, if we do it right, and part of doing it right includes ensuring that we localize and make sure our supply chains are domestic, to make sure that we have a supply chain there.

Dr. LOWENTHAL. That is right.

Mr. WALSH. So, a lot of steel, a lot of cement are going to be going into these turbines and their bases. To the extent that we can source that supply chain in the United States, it is only going to benefit U.S. workers and U.S. manufacturers.

Dr. LOWENTHAL. Thank you, and I yield back.

The CHAIRMAN. Mr. Tonko, you are recognized, sir.

Mr. TONKO. Thank you, Mr. Chair. Thank you for this hearing, and for your work on H.R. 5435. I also want to thank all of our witnesses for joining us today and sharing some very meaningful information.

The science is clear—we need to transition our economy to becoming carbon neutral as soon as possible. And I appreciate that the American Public Lands and Waters Climate Solution Act helps ensure that our public lands are part of the solution. But it is imperative that this transition is fair to impacted workers and communities. We cannot leave anyone behind.

Mr. Walsh, you have spent a lot of your career dedicated to helping communities and workers once dependent upon fossil fuels in this transition to new opportunities. In your experience, what type of policies have worked?

And do you believe this bill is a step in the right direction?

Mr. WALSH. I very much do. Let's start, first of all, with economic development. Certainly from my own experience, and I think the broader evidence is clear, that successful economic development results from bottom-up strategies that leverage local and regional assets to their fullest extent. A top-down approach is not going to work.

You also, though, need dedicated streams of revenue to make investments that are identified by those local and regional communities. You are going to need investments to replace tax base, you are going to need investments to diversify local and regional economies. And all that requires ranging from supporting emerging industry clusters to business incubators to infrastructure.

But then you are also going to need to support workers, particularly those who have lost jobs in the incumbent economy. And that kind of support requires everything from pension and retirement and healthcare support, to sometimes wage support, and certainly worker training for new jobs.

So, you need a holistic approach. We were talking about Colorado earlier. The BlueGreen Alliance worked very closely with the Governor and Colorado Legislators and the Colorado AFL-CIO to pass a bill in this 2019 session called—it was H.B. 1314, which sets up a strategic framework and an Office of Just Transition at the state level that will guide that kind of holistic strategy to support both workers and communities who are already facing dislocation because of the shift away from coal in the state.

Mr. TONKO. And Mr. Walsh, staying with you, this bill also emphasizes how public lands and waters can be used to produce clean energy. In your testimony, you mention that the expansion of

offshore wind is an example of creating jobs, while moving us toward a clean energy future.

How can we ensure that this emerging industry delivers on the promise of clean energy jobs being well-paying and family sustaining jobs?

Mr. WALSH. Let's make sure they are union jobs. And we also need to make sure that they work effectively, right?

As I testified earlier, the building trades have the most successful framework in their apprenticeship system for ensuring that the workers who do that work install it and operate it effectively. So, that is one way of doing it.

Mr. TONKO. And focusing on offshore wind, can you tell us some of the greatest obstacles for the expansion of that power supply?

Mr. WALSH. Well, I think we are going to have to grapple with offshore leasing at this point. I think there are some challenges there that need to be addressed.

I think we have to wrestle with making sure that the multiple uses of the lease sites are respected.

And then I think we need to make sure that we are sourcing materials effectively and, to the extent that we can do it, in regional economies.

There are other challenges. Those are the main ones. I think the biggest challenges aren't even surmounted, which is clear and long-term demand from power consumers. The fact that your state has already committed fully 9 gigawatts of offshore wind, and creates that kind of demand pull, gives developers the assurance and reliability they need to make major investments over a long period of time.

Mr. TONKO. Thank you.

And, Dr. Staver, I am not an ecologist, but I wonder if the Earth is able to handle the challenge Mr. Westerman is asking of it. Mr. Westerman's bill asks us to add a trillion trees to the global stock. Do you know roughly, or in any number, how many trees are currently on Earth?

Dr. STAVER. The only group that has tried to estimate how many trees are on earth is the same Swiss group that has produced the study that is sort of being contested. Their estimate is that there are 3 trillion trees on Earth, and they are estimating that you can add another trillion, which just isn't going to fit in the amount of space that is left, as you allude to in your question.

Mr. TONKO. OK, thank you very much.

And with that, Mr. Chair, I yield back.

The CHAIRMAN. Thank you.

The gentleman yields. Mr. Curtis, you are recognized.

Mr. CURTIS. Thank you, Mr. Chairman, and our witnesses, for being with us today. I am going to share with you what I discussed with a group the other day when I was speaking about climate, and they appreciated it. And I am not sure there are enough people here to appreciate it, but I asked them how many politicians it was going to take to solve climate change. And the answer to that is there is no scientific evidence that politicians can solve any problem at all.

[Laughter.]

Mr. CURTIS. With that in mind, I do welcome these conversations. I think they are important, so important that I have actually started a weekly—I call it #Curtisclimatechat, and I would invite all of you to join in that discussion. I think it is very important that Republicans have a voice on this issue, and that we are heard.

Part of that discussion is realizing that I have a county in my district that is actually called Carbon County. And when we villainize coal, we have to remember that we are villainizing hard-working people, people who have risked their health and put their lives into making it so we can flip a switch and have light and be warm, and that the real villain is carbon in the air, not carbon itself. And I think that is an important distinction.

I think forest management and planting trees alone will not stop climate change, but it is certainly part of a solution. And I appreciate Mr. Westerman's bill that works toward increasing trees. We talk about investing and finding answers to carbon sequestration, and Mother Nature has done a wonderful job of providing that for us.

I worry sometimes that, in this dialogue, that when something is proposed we quickly turn to what I call shaming, which is your idea just isn't good enough, it doesn't go far enough. And we have all these good ideas out there.

I listened to a podcast from somewhat of a liberal organization the other day, and they talked about three corporations' efforts, and they were substantial efforts: Microsoft has committed to go carbon neutral back to 1975. And the tone of the podcast was, well, that is too bad. They have all these resources, why aren't they doing more? And I just think that is a huge mistake that we make in this conversation.

I also feel like it is just very important to have bipartisan efforts around innovation and exporting U.S. clean technology overseas. I think we can do a lot to reduce carbon, simply by exporting some of our technology, realizing that it won't be long before 90 percent of the carbon in the air is coming from outside the United States.

So, thank you to our witnesses, and I would like to give a special recognition to our witness from Salt Lake City.

And I appreciate, Ms. Gleich, you coming out. You and I have had a number of conversations, and we always seem to have productive conversations where we can find issues that we agree on, even though at heart there might be a lot we disagree on. And could you just comment a little bit about the importance of bipartisan work, and finding common ground with people that you may not agree with everything on?

Ms. GLEICH. Yes. When I was getting ready to graduate from college, I did a political internship for Governor Gary Herbert at the Utah State Capitol. And I interned for Ted Wilson, who was at the time, his environmental advisor. And I really learned the power of bringing together different——

Mr. CURTIS. So, just for people that aren't here, a very, very strong Republican governor——

Ms. GLEICH. A very—yes, yes.

Mr. CURTIS. And a Democratic advisor.

Ms. GLEICH. Yes. So, it was really interesting, and I learned a lot by the way Ted would bring together different stakeholders

from different points of view, and have everybody come together to try to find solutions.

And I really wanted to thank you for your willingness to have these conversations about climate on Twitter, on social media. I really appreciate you opening yourself up like that, because I know, from my own climate activism, that it makes you the target of, potentially, a lot of public shaming, bullying, and at times harassment. So, I really appreciate your bravery in doing that.

Mr. CURTIS. It is important to me that Republicans have a voice. I truly believe that Utahans are the best environmentalists in the world, we just talk about it in a different language that sometimes doesn't communicate with people with different opinions.

Governor, I have just a few seconds left. Could you also speak to the importance of the—I know in your testimony you talked about the bipartisan nature. Can you just emphasize that, as well, for me?

Mr. RITTER. Yes, I would just say both at the governor level, the legislative level, the legislative academy that we run, it is Republicans and Democrats. We actually have a group of people called the Conservative Energy Network that have worked with Republican governors in Michigan, in Nevada, in South Carolina, and North Carolina on——

Mr. CURTIS. I am going to run out of time, but give me 10 seconds. You were nodding your head when I was talking about shaming. Can you give me your experience with that, just in a few seconds?

Mr. RITTER. I just agree—so many false choices. And both sides have been guilty of this. There are too many false choices, and we make the other people feel bad about putting out a false choice.

This is truly going to be done in a bipartisan way in America, it is going to be done in the middle, and it is going to involve a lot of solutions, not the least of which is growing trees, but also looking at our public lands and the carbon footprint.

Mr. CURTIS. Thank you.

Ms. GLEICH. I want to echo that really quickly, and just say that, while it is great to have these conversations about climate, the scientific data is clear that we need urgent action now to reduce climate change emissions.

Mr. CURTIS. You get the last word, because I am out of time.

Mr. Chairman, I yield.

The CHAIRMAN. I recognize Mr. Bishop.

Mr. BISHOP. Boy, are you out of time, Curtis.

I want to thank the witnesses for being here. You have driven us all out, congratulations. You lasted more than we did. Let me ask a couple of questions.

Mr. Marshall, in your service at the Forest Service you had a lot of different hats on. The one I think is most interesting is the wood innovation program. Can you very briefly just explain what the potential for growth of that program is, especially the sequestration benefits that come with CLT and mass timber technologies?

Mr. MARSHALL. Sure. I perceive the potential for growth is very significant. If you look at the building space right now with mass timber, CLT, and similar technologies, you are talking about using wood in a construction space where we have never been able to use

wood before. Building codes have been modified to accommodate this material, going up to 16 stories now. That is a vast potential construction sector.

Mr. BISHOP. No, that is good. I thank you. And maybe if you can get Lowenthal to find out a way of making his turbines out of wood, it will be even better.

Mr. Hollie, let me go through a couple of very quick questions with you, if I could, please.

Mr. HOLLIE. Yes, sir.

Mr. BISHOP. A lot of states, local governments, local communities depend on revenue from energy leasing projects. If that were to be suddenly cut or halted by either administrative action or litigation—which the bill opens up—what would be the impact on those areas to their budgets, their education programs, for example?

Mr. HOLLIE. It would be very concerning. I think they would lose that revenue, obviously.

I had the opportunity to visit Port Fourchon, Louisiana last year, and take the tour, and I saw firsthand some of these communities that benefit from the revenue shares that come from the Gulf. And I spoke to people, school teachers, et cetera, and I think it would be devastating to these communities if they lose it.

Mr. BISHOP. Mr. Walsh, I appreciate you mentioned a lot of things like AML, and especially the backlog we have on parks that has to take place. Were some of these programs—what would happen to AML, LWCF, and the maintenance backlog if we were to start shutting down these leasing projects?

Mr. HOLLIE. Well, I believe these programs are funded by the revenues. And I think, obviously, these programs would probably go away if we were to shut down this leasing.

Mr. BISHOP. Totally, yes. OK, look, let me ask you this on your expert opinion.

Mr. HOLLIE. Yes, sir.

Mr. BISHOP. A lot of the people are saying, yes, OK, if we do minimize the leasing, we are going to lose all sorts of jobs. But we will have a Federal program to give grants to create new jobs. In your expertise, how realistic is that kind of a goal?

Mr. HOLLIE. I would say very unrealistic. And I just look at myself as a 52-year-old man. And some of these people have had these careers all their lives. So, how are we going to re-train an entire workforce that has all their life worked in this particular industry?

Mr. BISHOP. So, the retraining in Appalachia has really proved effective over there in these programs?

Mr. HOLLIE. Absolutely not.

Mr. BISHOP. Let me just say one thing before I—well, I will give you a minute before I get done with this thing.

Ms. Staver, your testimony, at least I got to give you partial credit for something in there. You did write in there that there are other nature-based solutions, and that carbon is stored in other types of plants and soils, as well.

Soil holds over three times as much carbon as the atmosphere, and the capacity to hold more is really there. Scientific research is beginning to realize and recognize the existence of conservation ecosystem benefits that come from grazing, as well as potential of innovative grazing practices that would have a significant impact

on carbon sequestration, in addition to minimizing wildfires that take place.

If we could add a program that does carbon sequestration through enhanced grazing practices on public lands, as well as the growth of additional trees on both private, as well as public lands, coming up with a market like Mr. Marshall was talking about in his efforts, then obviously you have something that actually could have a great benefit.

I have a minute left. Mr. Westerman, do you want it?

Mr. WESTERMAN. I will take all I can get. Thank you, Ranking Member Bishop.

In the paper I submitted for the record earlier, I just want to read a sentence out of the summary on the front page. And, again, this is the paper from Yale and the University of Washington. It states, "More CO_2 can be sequestered synergistically in the products or wood energy and landscape together than in the unharvested landscape."

There is this idea that we are going to plant a bunch of trees and not do anything to them. But the research shows that that is not the best way to use our forests to sequester carbon.

I have another paper I want to submit to the record. Again, it is from the Yale School of Forestry and Environmental Studies, the Yale School of Architecture, and the Potsdam Institute of Climate Research. If there is no objection, I will submit that paper.

The CHAIRMAN. Without objection, so ordered.

Mr. WESTERMAN. And I yield back.

Mr. BISHOP. Mr. Hollie, I wanted to ask you about how much fossil fuel is taken in windmills, but I don't have any time to do it.

Mr. Chairman, I would like to submit for the record the International Energy Agency report on global CO_2 emissions in 2019.

The CHAIRMAN. Without objection, so ordered.

Mr. BISHOP. OK.

The CHAIRMAN. I would like to ask for unanimous consent that Mr. Gianforte have his opportunity to ask questions of the panelists, make comments, and then it will be my turn. Then we can wrap this up.

Sir, you are recognized.

Mr. GIANFORTE. Thank you, Mr. Chairman. I appreciate the opportunity to join the hearing today. I thank all the witnesses that are here to support my good friend and leader on forestry issues, Mr. Westerman, with his bill.

Yesterday, I met with the U.S. Forest Service officials in Missoula, Montana to discuss their progress on using tools that Congress has given them to improve the health of our forests. One of those tools in the toolbox is the Good Neighbor Authority, part of the farm bill, which allows the Forest Service to partner with state and local governments to carry out forest management projects.

They have made a promising start. The Federal forester in Region 1 told me yesterday that the Good Neighbor Authority has netted 14 projects in Montana this year and next that will yield

about 55 million board feet of timber. This is great news for the health of our forests and for Montana timber workers.

More, however, needs to be done to ensure the resiliency of our Federal forests. Mr. Westerman's Trillion Trees Act would extend the Good Neighbor Authority, which will expand the Forest Service's efforts to improve the health of our forests.

The legislation would also make it easier to complete large-scale reforestation projects, clearing dead wood and planting trees after fire, insects, and disease have damaged our forests. This will help improve wildlife habitat, prevent soil erosion and damage. Importantly, it can also boost our local economies and create good-paying jobs, grow opportunities in these impacted communities, and reduce wildfire risk.

Forests are an important carbon sink, as we have been discussing, so making use of timber that locks up the carbon while planting more trees is a win for everyone.

Mr. Marshall, thank you for being here. SmartLam North America is based out of Columbia Falls, Montana. Can you tell our colleagues just a little bit about your company?

Mr. MARSHALL. Sure. SmartLam started up in 2012. The long-term goal was to be making CLT for sustainable buildings as a green building company. But they started out by manufacturing industrial matting, a simpler product, to enter the market with. But it was done with a green objective.

They have been in production, as I described in my testimony. They have also played a key role in the development of the sector in the United States. They have done some specific things that have been sector-wide benefits. It has been a clear focus on the company. My own position is designed around sector expansion, not just benefiting SmartLam, so they have been a leader within the sector.

They were the first, but we now have six companies producing CLT in the United States. It is still a very new technology here.

Mr. GIANFORTE. OK, thank you, Mr. Marshall. And the legislation we are considering today, this Trillion Trees Act, will that help with forest management and sequestration of carbon?

Mr. MARSHALL. I believe so, yes.

Mr. GIANFORTE. OK. Thank you, Mr. Marshall. I think the contrast in the discussion is pretty clear. We have a plan that relies on innovation and trees to capture carbon, instead of over-bearing Federal mandates that drive up costs for consumers.

I appreciate the work that you have undertaken, Mr. Westerman and others, to offer solutions that really leverage American ingenuity, including the expansion of production and the use of mass timber that would have so many multiple benefits.

I will continue to oppose these over-bearing regulations and favor American innovation as we look for solutions, including, for example, halting all energy leasing on Federal lands, increasing royalty rates. These are just steps in the wrong direction.

At this time, if Mr. Westerman would like the time, I would be happy to yield.

Mr. WESTERMAN. I thank the gentleman from Montana. And just to wrap up, I want to stress again that this is not just a carbon

sequestration bill, it is a carbon emission reduction bill. Read the bill, read the text. There are three titles to the bill.

Plant more trees where we can, it is not just planting them, it is natural regeneration.

Grow more wood on our existing forest, make our existing forests more resilient. There are parts of the bill that deal with foreign aid, and helping other countries to have technical assistance, and understand what good, sustainable forestry management is about.

But the third part of the bill is to store more carbon.

So, I will just ask one last question. Does anybody on the panel know of a more pragmatic, proactive, economical, large-scale method to remove carbon from the atmosphere than forest?

I yield back.

The CHAIRMAN. Well, let me thank the panelists, I appreciate it very much.

Governor, 15 minutes after 12, I appreciate you staying. And, essentially, the question I was going to ask you Mr. Curtis asked you, and that was about—other than the points of division that are in this Congress, a lot of local communities, counties, my hometown, Tucson, and states are undertaking efforts to reduce carbon emissions. And that is both Republicans and Democrats. And I think that is a good example of the work you are doing in Colorado State with the Institute, it is significant. So, thank you very much.

Mr. RITTER. Thank you, Mr. Chairman.

The CHAIRMAN. The legislation that is before you today, H.R. 5435, that I am sponsoring, is not a panacea, but it does begin the very important process of addressing our public lands in that 25 percent.

And the key word in this whole discussion is transition. This transition is going to occur, whether this legislation passes or not.

And this transition is either going to be a forced transition, and with more and more negative consequences for the American people, or it can be a transition that tries to accommodate the issue of workers and displacement and training.

It could be a transition that deals with impacted and vulnerable communities, and deals with those environmental justice issues that are attached to the issue of climate change and the changing climate in this country. It is not just about energy poverty, it is also about pollution and the effect that it is having on the poor and communities of color across this country.

And it is also about inclusion, and using the revenue that oil and gas companies have profited greatly from our public lands, and using that revenue to re-invest in the American people, and to re-invest in the transition.

Other Members are doing good things. Representative Haaland, 30 by 30 is a good piece of legislation. What Mr. Curtis and I think Mr. Neguse are putting together in terms of a bill about job training and incentivizing, that is a good one. What Mr. Levin and Mr. Gosar are doing also about incentivizing. They are all parts and pieces.

And I think this Congress has a huge responsibility to understand the role that we have to guide policy—and that is not overbearing mandates, my friends, it is a response to a crisis, and a response to a real threat. We can continue to ignore it, we can wait

for innovation, we can wait for some bright light to go on and solve it for us. That is not going to happen. This is going to require our Nation to lead again, and our Nation to take initiative.

Like I said, my bill is not a panacea. It is a transition bill. It tries to deal with all the issues attendant on the issue of climate change, and to that 25 percent over which this Committee has jurisdiction.

I want to thank each and every one of you for being here today, and the meeting is adjourned. Thank you very much.

[Whereupon, at 12:21 p.m., the Committee was adjourned.]

[ADDITIONAL MATERIALS SUBMITTED FOR THE RECORD]

Submission for the Record by Rep. Grijalva

OUTDOOR ALLIANCE

February 25, 2020

Hon. RAÚL GRIJALVA, *Chairman*,
Hon. ROB BISHOP, *Ranking Member*,
House Committee on Natural Resources,
1324 Longworth House Office Building,
Washington, DC 20515.

Re: Outdoor recreation community support for H.R. 5435, the American Public Lands and Waters Climate Solution Act

Dear Chairman Grijalva and Ranking Member Bishop:

On behalf of the human powered outdoor recreation community, we write to express our support for H.R. 5435, the American Public Lands and Waters Climate Solution Act.

Outdoor Alliance is a coalition of ten member-based organizations representing the human powered outdoor recreation community. The coalition includes Access Fund, American Canoe Association, American Whitewater, International Mountain Bicycling Association, Winter Wildlands Alliance, The Mountaineers, the American Alpine Club, the Mazamas, Colorado Mountain Club, and Surfrider Foundation and represents the interests of the millions of Americans who climb, paddle, mountain bike, backcountry ski and snowshoe, and enjoy coastal recreation on our nation's public lands, waters, and snowscapes.

Our organizations and the community we represent are deeply concerned about the accelerating effects of climate change. While the effects on outdoor recreation represent a small part of the grave set of impacts occurring as a result of climate change, these effects will impair the quality of the outdoor recreation experience; cause health and safety concerns for recreationists; and inhibit the outdoor recreation economy. Moreover, as a community of avid students of conditions in the outdoors—from changing river flow patterns, to changes in snowpacks and glaciers, to coastal erosion—outdoor recreationists often have a unique view into changes occurring on our public lands and waters.

We recognize, as well, that the actions necessary to address climate change will require changes to the management of public lands and waters, and that our community has a responsibility to support a transition to renewable energy sources that also protects other resource values, including recreation and conservation. The outdoor recreation economy and the ability of outdoor recreation opportunities to attract new business opportunities to rural communities also may play a role in facilitating economic growth for historically extraction dependent communities.

We strongly support an approach to making public lands and waters a part of climate solutions that:

- Recognizes the important role of conservation in mitigating the effects of climate change and sequestering atmospheric carbon, as exemplified by the House's recent passage of the Protect America's Wilderness Act and initiatives like Rep. Haaland's H. Res. 835, setting a national goal of conserving at least 30 percent of the land and ocean in the U.S. by 2030;
- Ensures that public lands and waters are developed thoughtfully and sustainably for renewable energy, as exemplified by H.R. 3794, the Public Lands Renewable Energy Development Act, reported with strong bipartisan support by this committee last year; and
- Takes aggressive action to reduce greenhouse gas emissions from public lands, as proposed by H.R. 5435, the American Public Lands and Waters Climate Solution Act.

Given that our public lands and waters are both significantly affected by climate change and a major source of greenhouse gas emissions, we commend the committee's attention to addressing the role of public lands and waters in climate solutions and strongly support H.R. 5435. It is imperative that our country aggressively reduce greenhouse gas emissions, and public lands and waters are both a significant source of emissions and an area where the federal government can appropriately take ambitious action. The proposed schedule of increasing emissions cuts, culminating with a goal of net zero emissions by 2040, appears both achievable and responsive to the urgency of the climate crisis. Given the urgency of immediate action, we hope the committee and Congress more broadly will look for opportunities to move even more aggressively in making public lands and waters a part of climate solutions.

Additionally, we appreciate the immediate one-year pause in new fossil fuel leasing. In addition to the clear climate ramifications of additional fossil fuel development, speculative leasing is currently having a significant impact on conservation and recreation values across the West, and it is entirely appropriate the Department of Interior pause and develop a more measured approach to any new leasing activity.

We also strongly support:

- The requirement for land management agencies to proactively develop plans to achieve emissions reductions;
- The inclusions of provisions aimed at ensuring that agencies meets emissions reductions targets;
- The bill's attentiveness to both environmental justice communities and communities and workers dependent on existing fossil fuel development activities; and
- The focus on oceans as well as public lands.

We also greatly appreciate the requirement in Section 5(f)(7) that the Public Lands Greenhouse Gas Reduction Strategy include consideration of "the impacts of climate change on recreation on public lands and the outdoor recreation economy." In light of the direct conflict that can occur between fossil energy development and recreation, as well as the important contribution that outdoor recreation opportunities can make in supporting local economies—both through the traditional outdoor recreation economy and as a draw for employers, entrepreneurs, and high-skill workers in diverse industries—we suggest amending this section to read:

> (7) The impacts of climate change and fossil fuel development on recreation on public lands and waters and the outdoor recreation economy, as well as the potential for outdoor recreation opportunities to support economic diversification of fossil fuel transition communities.

Similarly, while we read Section 7, Economic Revitalization for Fossil Fuel Dependent Communities, to envision outdoor recreation amenity development as an appropriate use of funds and method for achieving economic development in transitioning communities, the committee should consider making this explicit in Section (c).

Additionally, in light of the important role of outdoor recreation opportunities in supporting diverse economic activity, the committee may consider whether adding a representative from the outdoor recreation community to the Just Transition Advisory Committee under Section (7)(e)(4)(E) would be of utility.

H.R. 5859, the Trillion Trees Act

The outdoor recreation community supports the goal of managing forested public lands to support carbon sequestration. As written, however, H.R. 5859 does not advance this objective and includes numerous deeply problematic aspects. In particular, we are concerned that:

- In general, the bill ignores the important role of protecting existing forests, particularly old growth, in favor of ramping up logging and monoculture replanting;
- The bill does not appear to reflect the science with regard to life cycle carbon emissions from forestry activities as contrasted with the efficacy of conservation;
- The bill would radically undercut the role of the National Environmental Policy Act (NEPA) in forest management decision-making, making decisions less likely to reflect sound science and reducing the role of public engagement.

* * *

On behalf of the outdoor recreation community, thank you for holding a hearing to consider H.R. 5435, the American Public Lands and Waters Climate Solution Act. We strongly support the committee in its efforts to make public lands and waters a part of climate solutions and look forward to working in support of this important bill.

Best regards,

LOUIS GELTMAN,
Policy Director.

[LIST OF DOCUMENTS SUBMITTED FOR THE RECORD RETAINED IN THE COMMITTEE'S OFFICIAL FILES]

Submission for the Record by Rep. Neguse

—Article titled, "America's Skies Have Gotten Clearer, but Millions Still Breathe Unhealthy Air," by Nadja Popovich, *New York Times*, June 19, 2019.

Submission for the Record by Rep. Bishop

—Article titled, "Global CO2 emissions in 2019," IEA Report, February 11, 2020. Available at: https://www.iea.org/articles/global-co2-emissions-in-2019.

Submissions for the Record by Rep. Westerman

—Article titled, "Carbon, Fossil Fuel, and Biodiversity Mitigation With Wood and Forests," by Chadwick Dearing Oliver, Nedal T. Nassar, Bruce R. Lippke & James B. McCarter, *Journal of Sustainable Forestry*, March 28, 2014.

—Article titled, "Buildings as a global carbon sink," by Galina Churkina, et al., *Nature Sustainability*, January 27, 2020.

—Article titled, "The global tree restoration potential," by Jean-Francois Bastin, et al., *Science*, July 5, 2019.

—Article titled, "Effective Uses of Forest-Derived Products to Reduce Carbon Emissions," by Bruce Lippke, Maureen Puettmann, and Elaine Oneil, CORRIM Technical Note, December 2019.

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